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THE VETERINARIAN,

A MONTHLY JOURNAL OF VETERINARY SCIENCE.

OCTOBER, 1890.

EDITED BY

PROFESSORS SIMONDS, BROWN, AXE AND McCALL.

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BOOKS, ETC., RECEIVED.

A Treatise on the Diseases of the Sheep; being a Manual of Ovine Pathology. By John Henry Steel, F.R.C.V.S., F.Z.S., A.V.D.

Agricultural Students' Gazette, August, 1890.

Topographische Anatomie der Körperhöhlen des Rindes, by Dr. Reinold Schmaltz. Part I.

The Journal of Comparative Medicine and Veterinary Archives, September.

The Quarterly Journal of Veterinary Science in India, May.

The following foreign publications are to hand:—*Annales de Medecine Vétérinaire*, Sept. and October, 1890; *Oesterreichische Monatsschrift für Thierheilkunde, und Revue für Thierheilkunde und Thierzucht*, October, 1890; *Archivio per le Scienze Mediche, La Clinica Veterinaria* (Milan), August, 1890; *Zeitschrift für Veterinärkunde mit besonderer Berücksichtigung der Hygiene*, Berlin, September, 1890; *Recueil de Médecine Vétérinaire*, September; and *Journal of the National Agricultural Society of Victoria*, Vol. V, Nos. 59, 60.

Papers received: *Mark Lane Express*, *North British Agriculturist*, *Land and Water*, *The Field*, *Live Stock Journal*, *Bell's Weekly Messenger*, *Agricultural Gazette*, *Farmers' Gazette*, Dublin; *Isle of Wight Observer and Chronicle*, *The Isle of Wight County Press*, *The Andover Observer*, *The Gazette*, Montreal; *The Evening Dispatch*, Edinburgh; *Macclesfield County Herald*, *The Licensed Victualler's Mirror*, and *The Peterborough Advertiser*.

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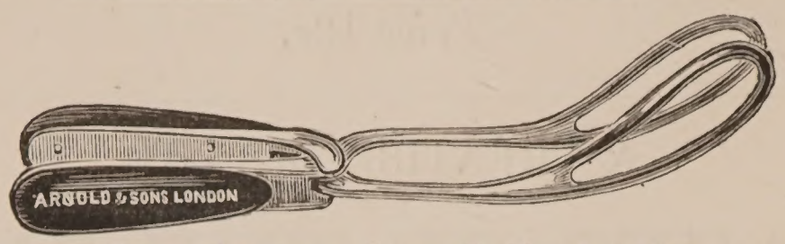

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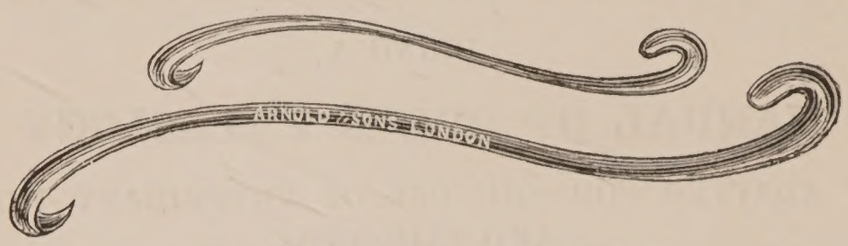

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THE

VETERINARIAN.

VOL. LXIII. No. 754. OCTOBER, 1890. Fourth Series, No. 430.

Communications and Cases.

THE VETERINARY DEFENCE SOCIETY AS A "SETTLING" SOCIETY.

By Thomas Greaves, F.R.C.V.S., Manchester.

The above sneer has been cast at our Society by some who say that *on principle we should defend every case*, meet every case in the court, and fight it out. In my paper on Murdock's case I showed the exceedingly unsatisfactory result of fighing a case in which you had not a leg to stand on. The advocates of this heroic system are for the most part non-members of the Society, who have never been members, nor taken the slightest interest in it. They know as much of its internal working and the difficulties we have to contend with as a man living in Timbuctoo; but their minds seem to take a pleasure in fomenting discontent and annoyance. Now, we have had considerable experience in this kind of cases—we have found to our cost the uncertainty of the law. It is said experience is a dear school, but many will learn in no other. Now we have learned our lesson, and the knowledge we possess has satisfied us, when our Council have carefully examined into the various phases of a case, and are of opinion that there are many doubtful or weak points in it, that where we have nothing but uncertainty and very probably complete failure staring us in the face, it is far better to settle it amongst ourselves amicably than to leave it to be settled by either magistrates, judge or a jury after it has been wrangled over by solicitors, counsel or judge, none of whom probably possess any sound

horse knowledge—such a settlement always entailing great cost and bitter estrangement.

I could give many instances where cases have been defended and resulted in lamentable failure and loss—loss of credit, loss of customer, and loss of money; cases in which members of our Society have been hauled up for damages—before and since Murdock's case—because they gave an honest opinion in an examination. I will therefore leave this heroic method of settlement to those who take a pleasure in fighting, and will give a few instances in which, since the power was given to us, we have conducted the cases to a successful, amicable, and honorable settlement.

No. 1. In Liverpool, in 1876, a veterinary surgeon was sued for laming a horse in shoeing and neglect; damages laid at £45. It went for trial. We had all our forces in battle array—counsel, solicitor, a number of witnesses and veterinary surgeons; the other side the same. A whole day was spent in court, but it did not come on for hearing. In coming down the stairs from the court, our President, Mr. Taylor, who was by my side, said in a loud tone of voice, so that the plaintiff who was close by could hear him, "*Whoever wins, it will cost a lot of brass.*" After this we were introduced to the plaintiff, and in a very short time, by straightforward, respectful, business-like arguments, the plaintiff meeting us in a kindly, gentlemanly manner, we came to an amicable settlement in full of all demands for about one third of the original claim. Claimant and defendant then shook hands.

No. 2. In Birmingham, in 1885, a veterinary surgeon was sued for injury to a horse. The horse was cast for firing hocks without owner's knowledge or consent; being an old horse he broke his back in his struggles. The claim was for £50. All the paraphernalia of law was set to work; it was going on for trial; our Council felt it to be a very unsatisfactory and doubtful case, and, foreseeing little probability of a favorable issue, decided to send a deputation to see the defendant and the plaintiff. We were told that the plaintiff was a most unreasonable, intractable man; that he would very likely refuse to see us, or would insult us and order us out of his office. We introduced ourselves in a straightforward, respectful, and business-like manner. He received us courteously and gentlemanly. After a while, we ventured to show him the weak points in his case. He came down one half of the demand at once, and after about two hours' temperate and firm argument we settled it with him for £6 10*s.* in full of all demands.

No. 3. In London, in 1884, a veterinary surgeon was sued for £50 for injury to a horse; a writ was served; it was going on for trial. Our Council, seeing the weakness of the case, determined to try and avoid a trial, since we could only see one result—failure. We were told the plaintiff was a foreigner—a doctor, very eccentric and passionate—that he would not see us; if he did, he would be sure to insult us. We introduced ourselves to him in a straightforward and business-like manner. He received us in a courteous and gentlemanly manner—treatment we meet with in every case. He said, "Now I can listen to you, gentlemen; but the defendant set me at defiance. He set his back against the wall, told me he would never pay me one sixpence towards my loss." After about one hour's firm and temperate argument we settled his claim in full of all demands for £7.

No. 4. In 1886 a veterinary surgeon of Liverpool was sued for laming a valuable mare in his forge, and neglecting her afterwards. The Council carefully considered the case, and decided it would not be wise to defend it since it looked weak and very doubtful in several points. We advised that an attempt should be made to settle it out of court; this the defendant strongly objected to. On principle, he said, it should be fought and defended. He suggested that the Society should allow him £10, and that he would fight it out himself, so confident was he that he could get a verdict in his favour. This application was consented to by the committee. The trial went on; he lost it, costing him three times the amount. He applied for a new trial, but his application was refused. So much for taking our cases to a higher court as recommended by Professor Pritchard.

No. 5. In Liverpool, in 1866, a veterinary surgeon of Preston was sued for £35, the value of a mare examined by defendant's assistant and bought on the faith of his opinion. A writ was issued; the opinion of our Council was that the case looked very fishy, and they determined that a deputation should see the mare, the defendant, his assistant, the seller, and also the plaintiff. Our President and I went to Preston, saw defendant, his assistant, and called twice to see the seller, but were unable to meet with him. We then went to Liverpool and saw the plaintiff, who received us very courteously; he took us twelve miles to see the mare, and back. Plaintiff told us that he purchased the mare to breed from and to do a little work, and that he had requested the person who had examined her to be very particular as to the state of her forefeet and wind.

We found the mare very lame on both forefeet, a permanent lameness. She was aged, was seventeen hands high, had a Roman nose, and was one of the rankest roarers ever heard. We considered it would be worse than madness to allow this case to go into court, principle or no principle. We argued the point with moderation and firmness, and in the end he settled it in an amicable and honorable manner for £10 in full of all demands. I would ask, Do not justice and equity both demand that reparation should be made in such cases? Our President and myself travelled over 100 miles, and spent the whole day at our own cost; and as we returned to our homes we consoled ourselves that we had saved the reputation of the profession by avoiding exposure and disgrace; and more than that, we had saved our Society *upwards of ten times that amount of its funds*. Now, I ask, Is there a man with a calm and sensible mind, not tainted by prejudice, with any generous instinct in his nature who will sneer at us and twit us as being "A Settling Society," when he sees plainly the great advantage of acting as we have done? My motto is—"Be just and fear not."

ATONY OF BUCCINATOR MUSCLES.

By Henry L. Pease, M.R.C.V.S., Veterinary Surgeon to Punjab Government, Koksur, Lahaul.

A case of this curious loss of power came under my observation in February last. The subject was a very badly nourished steer belonging to a poor native, who had not given it sufficient provender to ensure the proper nutrition of the muscular system, which was consequently in a very relaxed condition.

Symptoms presented were pain referable to the mouth, and manifested by dribbling of saliva from the lips, a considerable bulging along both cheeks in the position of a line running along the necks of the upper molars, and which, on manipulation, was found to be hard and immovable.

Examination of the mouth revealed a quantity of wheat straw chaff impacted between the cheeks and the gums, and so perfectly wedged as to be scarcely removable even in part by the finger. The accumulation of this semi-masticated material must have been gradual, as portions of it were in a state of fermentation, whilst others were comparatively fresh.

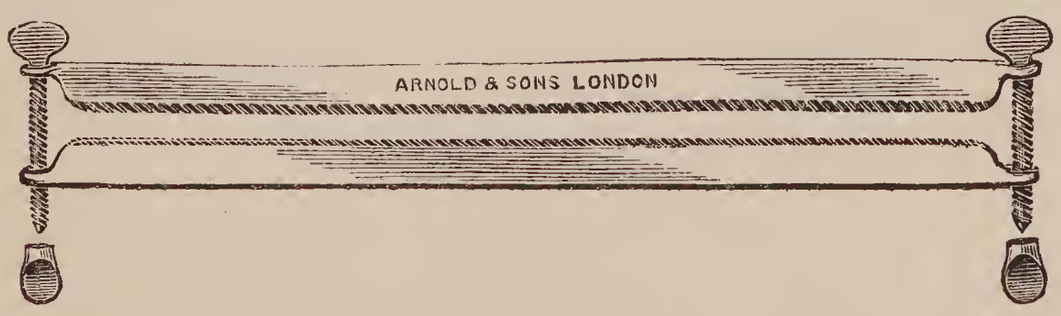
The treatment adopted was directed to ensuring a soft, nourishing diet and the administration of tonics after removing the impacted material and washing out the mouth with an antiseptic astringent gargle. The case, previous to its inspection by myself, had been under the care of a native cattle doctor, who, mistaking the swellings for bone, had applied a biniodide blister over them. This was allowed to work, and when quite clean, another light one applied.

After a fortnight the steer was given a little grass to eat, but it was found that the parts had not yet sufficiently recovered their tonicity to perform their functions normally. Recourse was again had to soft diet, and friction over the cheeks was applied twice a day. The general condition of the animal improved and the disturbance disappeared by degrees, and at the expiration of thirty-five days we were able to hand over the animal to its owner recovered.

NEW SCROTAL HERNIA CLAM.

Remarks by Captain Russell, F.R.C.V.S., Grantham.

The ordinary "covered operation of castration" in cases of scrotal hernia, as performed on horses that have attained four years old and upwards, is in my experience very risky, and often attended by most untoward results. I operate upon six to twelve such animals every year, and have used all sorts of wooden and metal clams, but not with the satis-



faction I had been led to expect. That bane to the skill of the surgeon, "tetanus," is perhaps my greatest enemy; but in some cases, notwithstanding every care and precaution, after the removal of the clams, the bowel will protrude in the course of an hour or two.

Messrs. Arnold and Sons have recently constructed a steel clam for me, which I am hopeful will obviate all bad results.

After having cast the horse and returned the bowel within the abdomen, I place above the testicle this long steel clam, which is made of selected metal properly tempered, so that it will not bend or snap. It is well tapered on the edges, so as to be as light as is consistent with strength; and being extra long, it is easy to get at. The screws also are guarded, so as to prevent any possibility of wounding the thighs. In operating I include within its grasp the common integument of the scrotum, the cord, and the appendages of the testicle. I tighten the clam every twenty-four hours if at all loose without casting the animal, and in about seven or eight days the whole of the strangulated parts drop off, leaving a firm cicatrising surface, from which hitherto I have had nothing to fear. I keep the animal standing from the time of the operation until four days after the parts fall off, allowing sufficient exercise daily to control the swelling. I hope the instrument may prove of service to the profession.

Pharmacy and Therapeutics.

GLYCERINUM IODI.

This valuable preparation, first introduced into veterinary practice by the writer some years since, is made thus:—Iodide of potassium, 1 part; glycerine, 2 parts; dissolve, and add iodine, 1 part; shake till dissolved. It is extensively employed, and has acquired a high reputation as a resolvent in cases of indolent glandular enlargement and where there are large watery exudations, as in various forms of chronic pleurisy and of diseased joints. It is also commended and has been used with considerable success by such an eminent authority as Mr. Edwin Faulkner, M.R.C.V.S., Manchester, for the purpose of injecting into serous cysts, as in hydrocele, or into diseased sinuses for the purpose of exciting inflammation, and causing obliteration of their cavity. It has the advantage of causing little or no pain such as the tincture or the liniment of iodine does. Tow, saturated with the glycerole of iodine, is an excellent and convenient application for inserting into deep-seated sinuses of a fistulous nature, and for the treatment of pole evil the writer has abundant testimony as to the exceeding value of this mode of treatment. A few drops of the solution diluted with water (1 in 5) and injected with a glass syringe into the ear of a dog suffering from canker, brought about remarkable and speedy

cures, and for this purpose the preparation is very highly commended.

TINCTURA IODI DECOLORATA.

This preparation, which is officinal in the Russian Pharmacopœia, is made as follows :—Iodine, 10 parts ; hyposulphate of soda, 10 ; distilled water, 10 ; dissolve, and add alcohol ammonia, sp. gr. 0·808 (10 per cent.), 16. Agitate, and then add alcohol (sp. gr. ·830—·834), 75, all by weight ; set aside for three days and filter. This is a nice form of iodine for painting over glandular strumous enlargements of the neck, as it does not stain the skin like the ordinary preparations of iodine. If the hands get stained with iodine they can easily be rendered colourless again by using a saturated solution by hyposulphate of soda.

NEW POTATO DISEASE.

A new disease of the potato has been described by Messrs. Prillieux and G. Delacroix, due to the presence of a bacillus which they have named *B. caulivorus*. It has the effect of discolouring the stem, which becomes brown, and then furrowed or shrunken. In examining the cells of the diseased tissue, they are found to be full of the bacillus. The death of the plant is speedily caused by the gangrene thus produced. The pelargonium is subject in the same way to the effects of the bacillus, so that either plant, if diseased, may serve to communicate the disease to the other.

BRONCHO-PULMONARY INSUFFLATOR.

The introduction of Allman's "nasal insufflator" (vide *Veterinarian* for April, 1881), an instrument which not only proved useful in veterinary practice for the treatment of diseases of the nose and throat, but also attracted the attention of most specialists in the sister profession to this mode of treatment of insufflating the nose and throat. A new instrument is now devised by Dr. Hartnett, of Harley Street, for insufflating the respiratory passages, which he calls a "broncho-pulmonary insufflator," and which formed the subject of an elaborate paper read before the Laryngology Section, British Medical Association, held at Birmingham, August 2nd. The insufflator has been found useful in acute asthma during the spasmodic attacks, also in phthisis, phthisical laryngitis, bronchitis, croup, and diphtheria, as well as in cases of Eustachian deafness, post-nasal catarrh, &c., as a ready and convenient means of introducing the

medicated air into the respiratory passages without any extraordinary effort on the part of the patient. Dr. Hartnett reports excellent results in treating cases of hoarseness (clergyman's sore throat), loss of tone of the vocal cords, and generally for increasing the resonance of the voice in singers and public speakers, by insufflating air charged with the free oxygen which is given off when the insufflator is charged with peroxide of hydrogen, to which a little spirit of ammonia, eucalypta, and terebene are added. The apparatus, which consists of a pneumatic chamber or bag and a compound medicating chamber, is best used by placing the bottle on a table or convenient stand, taking the rubber bag in the right hand and placing the mouthpiece well in the mouth with the lips closed upon it. The bag is then to be firmly squeezed, and the medicated air blown into the throat over the epiglottis into the open larynx during the act of inspiration. When the lungs are thoroughly filled and exhalation commences, expiration should take place through the nose. The time required for exhalation will be sufficient for the bag to refill itself (the air being drawn through both medicating chambers) and be ready for use at the beginning of the next inspiration. It is particularly requested that no effort be made to draw the air through the mouthpiece, the only exertion required being that of taking a deep inspiration when blowing the air from the insufflator.

About half the bottleful of hot water may be added when it is desirable to warm the air and increase the volatilising power of the drugs. The preparation ordered with the instrument is to be dropped into the bottle and the cork firmly pressed down. Continue the insufflation for ten minutes, and repeat this treatment four or five times at stated intervals during the day—in the morning after dressing, about mid-day, an hour or two before dinner, and at bedtime.

ANTIMONY HYPODERMICALLY FOR APOPLEXY.

In the *Medical Bulletin* (July, p. 243) Dr. J. F. Bird reports some interesting clinical notes respecting the hypodermic use of tartarised antimony in the treatment of apoplexy. Its sedative action is highly indicated, whether the condition be arterial or nervous excitement, or both combined.

He first used it in the case of the late Dr. James McClintock. On reaching the house, he found the doctor lying on the floor, having fallen from the sofa on which he had been

sitting. The respiration was hurried, but there was no stertor. Pulse 120, but not full or strong. Three or four doctors who had preceded him pronounced the case hopeless. No medicine could be administered by the mouth, and blood-letting was inadmissible. He immediately injected half a grain of antimony—tartar emetic—hypodermically, and very soon the pulse began to fall, and the hurried respiration abated. In half an hour he repeated the operation and soon found all the bad symptoms subsiding, and the patient passed a quiet night. Next morning he was perfectly conscious, and made a rapid recovery so far as the apoplexy was concerned. His next case was a Mr. Klein, who had fallen to the floor very suddenly, but with symptoms very different from those of the previous case. This man had violent convulsions, a rapid and full pulse, with stertorous breathing. Two physicians were with him, and regarded the case as *in extremis*. At Dr. Bird's suggestion one of them injected a fourth of a grain of antimony hypodermically, and in a few minutes the stertorous breathing became less marked, the pulse began to fall, and the convulsions became less violent. The doctor injected another fourth of a grain of antimony, when all the violent symptoms abated. Two hours afterwards the man sat up and was taken to his home. In another instance he was called in the night to see a Mr. Hance, who was seized in a manner similar to the foregoing cases. He was convulsed; skin hot and red; pulse greatly accelerated, but not very full or strong. Respiration was greatly quickened, and breathing stertorous. He was perfectly unconscious. Dr. Bird resorted at once to the antimony, using a fourth of a grain, which had a marked effect upon the symptoms. In about twenty minutes he repeated the dose, and had the satisfaction of seeing all the symptoms subside, and a state of semi-consciousness return. In this case, because of the general turgidness of the face and neighbouring integuments, he had a few cups applied, but allowed but little blood to be taken. There was no further trouble, and in a few days he was able to resume business.

Summing up his article, Dr. Bird is of opinion that for the treatment of apoplexy tartarised antimony is an invaluable therapeutic agent hypodermically administered. The same mode of treatment may be resorted to in canine practice when valuable dogs are attacked with fits.

Pathological Contributions.

PLEURO-PNEUMONIA.

On the 1st of last month the new Pleuro-pneumonia Act of 1890 came into operation, by the provisions of which the slaughter of cattle affected with this disease, and also those exposed to infection, has been transferred from the Local Authorities to the Board of Agriculture, and the compensation paid out of the Imperial Exchequer instead of the local rates. This marks a new era in the history of pleuro-pneumonia in this country; and it is to be hoped that the Central Authority will make more rapid progress in stamping out the disease than the Local Authorities have done in the past two years during which it has been their duty to slaughter both the diseased cattle and those in contact. From the scanty information obtainable since the 1st of last month it would be impossible to form any estimate of the actual number of outbreaks, cattle attacked, or healthy cattle in contact dealt with by order of the Board of Agriculture. In thirty-three of the reported outbreaks the existence of the disease has been verified by the veterinary officers of the Board after examination of the lungs sent to London for their inspection. In some of these outbreaks over 100 head of cattle had to be dealt with; and in one which occurred in Middlesex on two adjoining farms occupied by the same owner, something like 200 head have been slaughtered. In addition to these genuine outbreaks, a few others have been reported, in some of which the veterinary sugeons called in on behalf of the Board were able to decide by a careful examination of the suspected animal while alive that it was not suffering from pleuro-pneumonia, while in a few others it was considered expedient to slaughter the suspected animal and examine the lungs before the existence or non-existence of the disease could be determined. In our next we hope to give more detailed information as to the working of this new Act by the Central Authority.

ANTHRAX.

In the first eleven weeks of the quarter just ended there have been 23 fresh outbreaks reported in England, in which 42 animals were attacked, 1 diseased animal was killed, 32

died, and 27 recovered. No case of anthrax was reported in either Wales or Scotland during these eleven weeks.

SWINE FEVER.

In Great Britain during the eleven weeks ended September 13th there were 1496 fresh outbreaks of this disease reported, 7046 pigs were attacked, 2872 diseased swine were killed, 3244 died, 1041 recovered, while 479 remained alive forming active media from which the disease might spread.

RABIES.

During the eleven weeks above referred to there have been 37 cases of rabies reported in England. These have occurred in the Counties of Bucks, Derby, Essex, Hants, Lancaster, London, Northampton, Sussex (West), Warwick, York (East and West Riding). The disease is still confined to England. No cases have been reported in either Wales or Scotland.

FOOT-AND-MOUTH DISEASE.

Although this disease no longer exists in this country it has for some considerable time been very prevalent in many parts of Europe, and the possibility of its importation into Great Britain has caused some anxiety.

Recently an outbreak of a foot-and-mouth disease has been reported in the United States by the State Veterinarian of Missouri, M. Paul Panqin, who describes the disease in question as follows :

"There is a disease now prevailing among cattle in several counties in which blisters break in the mouth, particularly about the lips and gums. The cattle appear gaunter and gaunter day after day for want of food. If examined the nose may be found hot, dry, and sometimes wine-coloured in patches. The blisters appear on the inside and on the margin of the lips, which become more or less raw and bleed easily. The pad (upper jaw gum corresponding to the front teeth of lower jaw) also presents blisters, which soon break, and form a thick, yellowish, cracked, soft crust. Sometimes the tongue is blotched or blistered, but rarely. There is much drooling of stringy, watery matter from the

mouth, and the odour from it is anything but agreeable—often very fetid indeed. These yellowish crusts slough out after a few days and leaves raw surfaces or sores. In a few cases complications arise by which gangrene (rotting, in fact) of the gums extend to the jaw-bones or teeth, and in a few instances the teeth became loose and even dropped off. There is frequently a peculiar smacking of the lips. Most of the cases become lame and stiff from the same lesions breaking in the foot (the cleft particularly). Occasionally also blisters and consequent results (scabs, and even raw sores) occur on the udder. In three or four cases I know these appeared on the neck, the belly, the back, and about the root of the tail. Uncommonly there is diarrhœa. The malady runs its regular course in an average of about eight days. (The shortest course I have noticed was five and the longest eleven.) There are irregular and complicated cases which last much longer. Fever more or less keeps up most of the time. The type is very mild, death being, so far as I can learn, less than 1 in 200."

The State Veterinarian further states that he is not yet positive as to its being the European foot-and-foot disease, though it corresponds exactly with authoritative descriptions of it, but he is quite satisfied of its epidemic nature; and adds that it is neither eczema, aphtha, nor ergotism, with all of which he is well acquainted. It may at first sight be doubted whether this is really a case of foot-and-mouth disease, although the symptoms are so much alike. On reference to the First Annual Report of the United States Secretary of Agriculture it will be seen that 35 cattle from Belgium and 14 from Germany were imported into the United States last year, notwithstanding the existence of foot-and-mouth disease in both those countries. Importation of animals into the States from any country in which this disease exists may at any time be followed by an outbreak there.

Extracts from British and Foreign Journals.

"SIR ANDREW CLARK AND THE ARMY MEDICAL STAFF.

"*To the Editor of 'The County Gentleman.'*

"SIR,—In your issue of the 16th you submit to critical examination and judgment a portion of my speech to the

War Minister when heading a deputation sent by the Medical Corporations of the United Kingdom to represent the grievances of Army medical officers, and to ask for their remedy. As your mode of putting the matter is inaccurate —I do not doubt unwittingly inaccurate—and as, therefore, the judgment pronounced upon my action cannot be sustained, I request that you will be pleased to grant me space to make good this contention.

"In reply to the question whether the granting of the concessions demanded by Army medical officers would not necessitate the granting of like concessions to veterinary surgeons and chaplains, I answered 'No!' inasmuch as no just comparison could be drawn between such persons and medical officers.

"'Medical men, Sir Andrew went on to argue, are combatants, the "other persons" are not. I cannot congratulate Sir Andrew either on his good taste or on his knowledge of the facts.' At the conclusion of your notice you say, 'Under the circumstances Sir Andrew's reference to "the other persons" was as ill-timed as it was ungenerous.'

"First as to the facts. I did not say that medical officers were combatants. I said that they were officers with military duties and responsibilities; that they were the only officers with such duties and responsibilities who had no distinct substantive military rank; and that they were not just subjects of comparison with chaplains, veterinary surgeons, and other persons who had civil, and not military duties to perform. The military duties and responsibilities of Army medical officers are both numerous and important. Chief among them are (*a*) the command and discipline of the Medical Staff Corps, and of all persons either attached to the corps or else on duty in military hospitals; (*b*) the instruction of the corps in infantry and stretcher drill; (*c*) the responsibilities attached to the pay, clothing, arms, and general equipment of the Medical Staff Corps; (*d*) the accounting of officers for hospital buildings, equipment, supplies, and necessary stores.

"Such are the statements made by me in that portion of my speech which you have submitted to critical examination. I have taken every means in my power to inquire into the grounds of these, and I believe that every one of them is within the limits of a literal accuracy.

"In the second place you say that my statements were ill-timed and ungenerous, and you put within points of quotation the phrase 'other persons,' as if I had meant to insinuate inferiority and unimportance. The statement

which you criticise so adversely was not a voluntary statement. It was made in reply to a question put by the War Minister. It was strictly accurate. It was not made at the expense of any other department; and neither I, who made the statement, nor any of the Presidents of the Medical Corporations of the United Kingdom who accompanied me, entertained (as your criticism suggests) a thought of inferiority or of unimportance in 'the other persons' whom you have thus signalised. On the contrary, we regard with high and just respect the importance and character of the ecclesiastical and veterinary departments of the Service; but, as they have no strictly military duties to perform, they are not on this matter fit subjects of comparison with medical officers who have, and who, in consequence of it, claim a substantive military rank.

"In speaking of other claims of medical officers to substantive military rank, I mentioned the frequent failure of health among them, their exposure to special perils on the battle-field, and the exceptionally high rate of mortality which prevails in the department. I am reminded by an anonymous correspondent that both chaplains and veterinary surgeons are also exposed to the perils of the battle-field without directly participating in the battle. That is quite true, and the records of their heroism are not forgotten. But the question at issue lay between combatant and medical officers; the reference to chaplains and veterinary surgeons was only incidental and illustrative; and to have entered into any statement of their high merits and claims would have been irrelevant to the matter in hand, and an unpardonable encroachment upon the time of the Minister.

"In conclusion, I desire to express my sincere regret that anything which I have said upon this subject should admit of the interpretation of being ungenerous to members of other departments of the Service. No one who heard my evidence considers such an interpretation of it as possible—certainly no disparaging or depreciatory thoughts of chaplains or veterinary surgeons were ever present to my mind—and I entertain the hope that, after a reconsideration of my evidence, as herein corrected, you will see reason to withdraw the judgment you have pronounced upon it, which, if reiterated, I should have to regard as both unsound and unjust.

"I am, Sir, your faithful servant,

"And. Clark, M.D.

"Dulquharran Castle, *Aug.* 23*rd*, 1890."

We have been asked to give insertion to the following reply by an esteemed and valued correspondent.—EDS.

"Sir Andrew Clark, as will be seen from his letter in another column, objects to my remarks anent the Army medical difficulty which he has taken in hand. Now my sympathies are entirely with the doctors. I regard the arguments of their fighting comrades for the most part as unsoldierlike, ungentlemanly, unpatriotic, and unjust. But I object to Sir Andrew's arguments also because in them he has unfortunately—but of course unintentionally—fallen into the very error which, to my mind, makes the action of my soldier friends so paltry. 'I am a fighting soldier,' says my worthy combatant friend. 'Why should the doctor consider himself my equal?' 'I am a doctor,' says Sir Andrew Clark, on behalf of his profession. 'I am bound to admit that the combatant is my superior, because I aspire to his rank and privileges, and am honoured by being mistaken for what I am not; but why should a chaplain of a veterinary surgeon claim to be considered the equal of his professional superiors?'

"I am grieved beyond measure if I, in the first instance, misinterpreted Sir Andrew Clark's meaning. His letter places the matter so clearly before me that I am sorry to have to say that I differ from him entirely. It would appear that I have a far higher respect for the medical profession than he has himself, for I fail to see how any doctor worthy of the diploma he bears can consider himself elevated by being called by a combatant title; and in his heart of hearts I feel sure that Sir Andrew, holding the high place he does in the profession he adorns, will agree with me. The Army medical officers have nothing to gain and everything to lose, I maintain, by agitating for military titles and military command, though they should have the best wishes of all right-thinking Englishmen with them when they demand that the recommendations of Lord Camperdown's Committee should be carried out. The only effect of Sir Andrew Clark's letter is to show that what the medical officers are demanding is nothing more nor less than 'substantive rank.' I do hope and trust most earnestly, as a great admirer of the medical staff, that this concession may never be granted, for I can conceive nothing more calculated to bring a noble profession into contempt.

"By-the-bye, some of the correspondents of the *Morning Post*, *re* this subject, speak of the departments of the Army as though their officers were the inferiors of their regimental

comrades. Such a contention is indefensible. Without its departments the Army would be helpless. No wonder the military machine gets out of order so frequently in war-time if those who are responsible for the working of it allow feelings like these to exist. In the minds of these correspondents the idea of improving the efficiency of the Army never arises apparently. The only fear is that a departmental officer may be taken for a combatant, and in the estimation of these magnanimous writers 'departmental people' are not fit and proper persons to mix with the highly born gentlemen who fill the combatant ranks of the Army. The British officer has the reputation of excelling in gentlemanly qualities. Yet this is the tone in which some who profess to represent him will approach the discussion of a question of no little importance to the welfare of the Service."

TEXAS FEVER (SOUTHERN CATTLE FEVER, ETC.).

By Paul Paquin, State Veterinarian, Missouri.

Extracted from the *Journal of Comparative Medicine and Veterinary Archives.*

(*Concluded from* p. 615.)

"Such specimens as liver, kidney, spleen, &c., were taken fresh immediately after death of the animals at slaughter-houses, then wrapped in cloths previously soaked in either a strong solution of bichloride of mercury (corrosive sublimate) or carbolic acid; then they were immersed in pure glycerine in fruit jars and sealed. They all were preserved absolutely free from the usual results of contamination by air germs. The specimens of blood, bile, and urine were nearly all sealed in sterilized glass tubes (pipettes) without being exposed to the air. Really all the foregoing substances, therefore, were preserved and studied containing the same things as before the death of the animals that furnished them.

"Our endeavours were first directed toward the discovery in the foregoing specimens of a virus capable of producing Texas fever. With that end in view many difficult problems presented themselves. It was during the cold season, when the disease is induced with difficulty, and at a period when we knew of no other animal susceptible to the fever in question than cattle, which could scarcely be bought for less than 20 dollars per head in average. Our limited means precluded the use of many such comparatively high-priced experiment subjects. Consequently we had to go very slowly.

"*First investigations :—Blood, Urine, Bile, Liver, Spleen, and Kidney from healthy Southern Cattle and from Unborn Calves (fœtus).*—Thirty-three different specimens from twenty different Southern cattle of several counties of Texas and the Indian Territory were analysed. In all of them without exception we found after a long and tedious search germs that could be seen plainly and stained fairly well. Unstained in the tissues of the liver, spleen, kidneys, glands, the germs appeared as bright or bronze-coloured corpuscles, of irregular shapes, apparently grouped in and out of the cells of the organs, and disseminated in the spaces and tissues. Some of these bodies appeared almost spherical, others like bright specks, and still others as ovoid bodies or short oval rods of various dimensions. In the blood and bile the germs were found frequently in a motile condition. They would roll on themselves, bend to and fro, move from place to place, taking a variety of shapes which gave them a resemblance with some of the corpuscles found in the liver, &c. The germs could be stained in the blood and tissues, but only with difficulty in the bile. The forms in the blood were small and like the finer organisms in the tissues. The blood-elements were impaired. In the bile, the germs were often in the shape of rods of considerable length. It contained, also, as the kidneys and urine, fine, bright bodies, occasionally double as diplococci.

"Our first attempts to cultivate these germs artificially were not satisfactory, but still we did reproduce some forms. Our next step was to investigate the soils, manures, waters, fodders, &c., to see if the same species of germs could be found. We discovered similar forms mingled with numerous others in every specimen with the exception of dry hay, subsoil, spring water, well water, and one specimen of surface soil. The manures were particularly prolific. We made cultures and succeeded with difficulty and not very satisfactorily to produce germs similar in appearance and in mode of growth to those grown from liver, spleen, kidney, and bile. Inoculation of white mice with these cultures in state of purity caused death occasionally, but only when a large quantity was used. The same germs were found in the liver, spleen, &c., of the little animals that had thus perished. With these cultures, however, we could not kill cattle with typical symptoms of Texas fever, although we did produce fever as high as 104° and 105° F. in some of them.*

"It will be seen by these preliminary researches, as im-

* The normal temperature of cattle is about 101° F.

perfect as they are, that two important probabilities were established. First, that certain microscopic beings—germs possibly identical in most of the cases, were found in the normal liquids and *tissues* of infectious Southern cattle that *always appear healthy*, and even in the *young before birth* (one was not older than four months after conception), as well as in the manures, surface soils and waters, &c., of grounds where the fever originates. Second, that this germ was absent in dry fodder, in well water, spring water, the subsoil (even the deep layer of sod being free). True, we were groping somewhat in the dark, and under disadvantages that made progress exceedingly slow, tiresome, and even somewhat doubtful to us, but it pointed to a possible clue. It furnished something like a tangible basis for further operations.

"Questions 1, 2 and 3 of our objective task being partly answered, we could take up the remaining nine—*i. e.* 4, 5, 6, 7, 8, 9, 10, 11, 12, with more hope.

"A thirty-acre pasture was secured on the Wabash Railroad between Centralia and Hallsville, in Boone County, Missouri. It was divided into two portions, and in one of them twenty-four pens were constructed with alley and chute leading directly to the railroad track, where, through the kindness of the Wabash management, experiment cattle were afterwards loaded and unloaded at will. The pens were divided into two sets—one dozen numbered from 1 to 12 and one dozen lettered from A to L, inclusive. The strong board fences forming the enclosures were six feet high, and so closely framed that the cattle could not eat through although they could smell and even lick each other between the upper boards. The bottom boards came close enough to the ground to prevent eating underneath. The cattle were fed on the ground and watered in troughs purposely constructed. Their food was hauled to them from a distance.

"*Experiments A.—Tests of the Virulence of Texas Cattle, and Exposure of Unprotected Northern Natives.*—June 20th, received from the Texas Agricultural Experiment Station eighteen head of cattle supposed to be infectious. They had been shipped June 15th from Uvaldo, Uvaldo County, Texas, in a Street stable car. Before loading, the floor was covered three inches thick with sawdust and sand soaked with fifty gallons of water containing five pounds of corrosive sublimate (a quantity much larger than necessary), and a board was placed inside all around the car to prevent any droppings on the track from the floor.

"After unloading the cattle at the experiment pens, the

car was hauled to Hallsville and then to Columbia. Northern cattle *had access* to it and to the manure it contained; *not a case* of Texas fever occurred thereby. The cleanings of this car was also purposely tested on native Missouri cattle, and failed to produce the disease. Those eighteen head of cattle were distributed as follows: Pen 1, seven head; pen 2, eleven head. Three Missouri natives were put at once (June 20th) with the Texans in pen 1. The eleven subjects of pen 2 were changed every second day from pen to pen until they reach pen 9 inclusive, then every day until pen 12 inclusive, which they left July 9th, making in all nineteen days in pens, and with five days of travel making twenty-four days since they left Texas soil. June 21st, two native Northern cattle were put in pen 2. July 12th, we began to test the virulence of pens 3 to 8 inclusively where Texas cattle had been, by putting one head of Northern cattle in each. The results were as follows:

"July 30th, cow in pen 8 died of Texas fever, exposed seventeen days. Virus of germs had been deposited thirty days before by the Texans. August 5th, bull in pen 5 seriously ill with the disease, exposed twenty-three days. The germs had been on the ground forty-two days at most. August 14th, cow in pen 1 died of Texas fever, exposed fifty-five days. The germs had been deposited by Texas cattle June 20th, or fifty-five days before. (This pen in shade.) August 15th, heifer in pen 7 died of same disease, exposed thirty-four days. Germs on the ground since June 28th, or forty-nine days. (Pen not shaded.) August 16th, heifer in pen 6 died, exposed thirty-five days. The germs were in the pen since June 26th, or fifty-one days. The exposed subjects in pens 2, 3, and 4 showed very feeble signs of illness. Nothing to be noticed by any one but the experienced observer. (Pen shaded part of day.) We had not enough cattle to test the virulence of pens 9, 10, 11, and 22, but the Texas stock, after leaving pen 8, *i. e.* the 14th day after shipment from the South, seemed no longer infectious, as we mingled them with native stock in the pasture and no disease occurred thereby. I do not consider the test sufficient, however, on this particular point. June 21st, manure fresh from Texas cattle was deposited on the grass of pen G, and some was forwarded to the laboratory for analysis and tests. June 22nd, 24th and 28th urine fresh and pure from Texas cattle was spread over the grass in pen F, and some of the same specimens were studied at the laboratory. Neither of these pens were at any time contaminated from any other source. August 6th, a native steer was placed in each pen.

August 27th, or twenty-one days after exposure, the steer in pen F died of Texas fever, having contracted it from the urine deposited on the ground sixty-six, sixty-four, and sixty days previously. The steer in pen G, where the manure was placed, showed so faint signs of the malady that only an experienced veterinarian could have observed anything unhealthy.

"*Experiment A* 1.—*First Exposure of Inoculated (or Vaccinated) Northern Stock,* August 17th and 27th.*—After some of the deaths above recorded, and after pens 1 to 8 inclusive had been proven infectious, the disease and deaths recorded, they were thrown open together and in them were placed ten more head of Missouri cattle, six of which had been purposely inoculated with the view to protect them, and four were not inoculated. The six inoculated all resisted the fever, whilst of the four not inoculated two died of Texas fever, one was seriously ill and recovered, and the other had no signs of serious sickness. These inoculations were made with weakened virus. More of this in the article on the subject of inoculation.

"*Experiments A* 2.—*Analysis of Specimens from some of the Above-mentioned Texas Cattle and from Natives that contracted the Fever.*—Fifteen fresh specimens of manure, urine, blood, bile, liver, spleens, and kidneys of different apparently healthy Texas cattle were analysed microscopically, and in all instances germs similar to those already described were found. The liver and bile in particular contained a great many. Twenty-six of the same kinds of specimens from all the Missouri cattle that died from Texas fever, or that were killed while suffering from it, also presented *always* the same germs, but in greater numbers. Great care was taken that the specimens in every case was procured right after death by fever, or right after killing the patient so affected. A special article on the germ of Texas fever will be found further. Inoculations of Missouri cattle with *strong* virus from infected organs of both *Texans* and *natives* produced Texas fever. That also will be better explained further on.

"*Experiments B.—Tests of Arkansas Cattle, June 28th,* 1889.—Dr. R. R. Dinwiddie (Veterinarian of the Experiment Station of Arkansas) shipped us from Helena, that State, in a car prepared as for the Texas shipment, twenty-five head of cattle supposed to be capable of conveying Texas fever. They arrived at our pens July 1st. The

* Inoculation and vaccination are used here in the sense of protective inoculation with modified germs.

cattle had been marked and divided into several lots, and part of them had been dosed with antiseptic drugs, with a view to destroy the activity of the germs in the animals and render them powerless to cause the disease on their arrival here. Unfortunately, the man who accompanied the stock failed to do his duty. On his way here he mingled the treated and untreated cattle together in the previously separated car, and then he left them by themselves during a large portion of the journey. The result was the stock could not be identified positively by the torn tags or for the want of marks; consequently the object desired in so treating the cattle antiseptically before shipment from Arkansas could not be intelligently sought. We therefore repeated in different pens the experiments made with the Texas cattle. In pen A five cattle were placed, in pen B five, in pen C four, and in pens J, K, and L, opening in one another, eleven. Three of these Arkansas cattle, one in pen A and two in pens J, K, and L, were sickly when they arrived and soon succumbed. In two of these there were marked lesions of Texas fever, and its specific germs were found in abundance. The other had a severe lung congestion, with mild lesions of Texas fever. These deaths are attributed to a combination of causes, chief of which were two days' neglect in feeding and watering by the negro who should have closely attended to the stock, as ordered by Dr. Dinwiddie. Right after the severe treatment that these animals had undergone, their bodies being impregnated with Texas fever germs, the best hygienic condition possible was necessary. July 30th, all of those Arkansas cattle were turned out of the pens. The same day five inoculated Missouri natives and two not inoculated were put in pens J, K, and L. The inoculations had been made with virus of a nature which was doubtful at the time of operation. August 8th, one native cow was turned into pen C, not inoculated. August 11th, one native heifer was turned into pen B, not inoculated. August 20th, one native cow into pen E, not inoculated. The results were as follows:—August 20th, in pens J, K, and L one vaccinated animal, and next day two unvaccinated, presented symptoms of Texas fever. August 25th, heifer in pen A died of Texas fever, not inoculated. August 27th, one cow in pen C fatally ill from Texas fever and killed purposely; not inoculated. Same date, one of the unvaccinated heifers in pens J, K, L, died from Texas fever. Thus, of the five vaccinated or inoculated one was sick, but not one died; of the five unvaccinated exposed in different pens three died of Texas fever.

"*Experiments B* 1.—*Analysis of Specimens of Arkansas and Diseased and Native Missourians.*—Just as for Texas stock, specimens of various kinds were carefully investigated. Seventeen large specimens of manure, urine, blood, bile, liver and spleen from four different Arkansas cattle, and fifteen similar ones from natives that died from or were killed on account of Texas fever, were collected fresh and subjected to searching microscopical examinations and bacteriological studies. In all of them the germs found in Texas cattle or diseased natives, as stated in Experiments A, &c., were noticed.

"*Experiments C.—Tests with the Second Lot of Texas Cattle.*—These consisted of eighteen old cows shipped by Dr. Francis from the ranch of Col. Fulton, near Corpus Christi, August 6th or 7th. They arrived at our pens August 13th. The car had been previously prepared to prevent infectious droppings on the track, as for the other shipments. This lot was intended for the purpose of testing means to disinfect Southern cattle alive and render them harmless to Northern cattle. Some of them were to be untreated, to serve as witness cases. Unfortunately, Dr. Francis failed to secure the consent of the owner to this arrangement, and the cattle were shipped to us to be tested as to their individual virulence—the owner claiming that the cattle of his ranch never convey Texas fever. Our investigations not being carried on for any one ranch, however, this testing of one exclusive herd of cattle irrespective of a plan prearranged on an intelligent basis, and with respect to our financial condition and the welfare of the country at large, was not desirable. However, we did the best we could under the circumstances. The Fulton cattle were all placed in pens I and H, that had never been used for any purpose. September 9th, one yearling steer and one yearling heifer, natives, were put in the above pens. We had been unable to find, before this date, any stock at sufficiently low price for our extremely limited funds. October 19th, these two native cattle were turned out, no signs of fever having been detected by the superintendent. The thermometer was not used.

"*Experiments C* 1.—*Analysis of Specimens from the Fulton Cattle.*—Samples of urine, manure, bile, blood, liver and spleen demonstrated the germs in a comparatively scarce quantity. Inoculations of a native heifer with small quantities of virus from these animals produced only a slight fever. By inoculation of a large quantity of liver pulp we did succeed in producing a good case of Texas fever in a

native. These cattle seemed less virulent than others that we had. I am informed that the Fulton ranch is supplied with well and sulphur water. This suggests a valuable proposition, perhaps. Is it not possible that the peculiar water of the Fulton ranch is antagonistic to the life of the germ of Texas fever, and thereby modifies its virulence? We know the antiseptic properties of sulphur, for instance, and this is one of the very agents that we had instructed Dr. Francis to use to disinfect Southern cattle alive before shipping them North.

"*Deductions from the Experiments.*

"1st. That some of the germs found in our preliminary investigations of Southern soils, waters, manures, urine, bile, liver, &c., and those found in the bodies of Southern cattle subsequently shipped to us, and found in cases of Texas fever in Northern cattle, are identical.

"2nd. That the germs of Texas fever are to be found in all Southern cattle coming from infectious grounds, and not only in their manure, but in their blood, livers, spleen, kidneys, urine, &c., notwithstanding that they apparently remain healthy. The same is the case even with unborn calves, which are therefore naturally inoculated in the mother's womb.

"3rd. That the average period of exposure before the Texas fever appears North, in cattle exposed to the freshly deposited germs brought by Southern stock, is about thirty days; but this may vary much according to the sun heat and warm weather, which is a favorable condition, and cool or cold, which is unfavorable. The cattle in pens 1, 2, 3, and 4, which were more shaded than the remainder, resisted longer and better.

"4th. That the germs in fresh excretions of Southern stock remain apparently harmless between thirty and fifty days, and in a cool shady place may remain thus much longer.

"5th. That cattle exposed to either manure or urine from Southern stock may contract Texas fever, and that inoculation from pulp of liver or spleen of such subjects may produce it.

"6th. That the germs must be taken into the body by the mouth or by inoculation, and that the disease is not conveyed by the breath of infected or infectious individuals.

"7th. That protective inoculation may render the system of Northern cattle capable to better resist the action of the Texas fever germ.

"8th. That sulphuretted water is perhaps inimical to the life of the germ and favorable to its modification and death.

"*Special Experiments to Test Protective Inoculation.*

"*Note.*—Having discovered early in our experiments that Southern calves really have the germs of Texas fever in their system before birth, I became convinced that that was the first reason of the immunity of Southern stock against this affection. The young are actually inoculated—or vaccinated, to use a more familiar though not so accurate a term—in their mothers' wombs, and when dropped on the infectious Southern soil they are prepared to meet the virus that it contains just as well as a child vaccinated against smallpox can be safely exposed to that disease. The question that impressed me then was this: Why cannot the Northern cattle be artificially inoculated with the germs of Texas fever before exposing them South, or on any infectious ground, on the same basis that the Southern calves receive the germs from their mothers? I believed it possible, and we began experiments to that end. We soon found, however, that the proposition was not as simple as it appeared; obscure problems and discouraging failures met our efforts every hour of the day, and it required constant, harassing, microscopic researches and tiresome operations to keep at all in anything like a reasonable route. Inoculation after inoculation proved futile. We could scarcely detect anything like Texas-fever symptoms in our first attempts to transmit it. Little by little, however, the darkness disappeared, the way became clearer, and at last we had in our possession, and partly under our control, the germ of the deadly plague, and we could cause this malady almost at will in a more or less virulent form. And at this writing we can cultivate the germs with comparative facility outside of the animal body, and then reproduce them in cattle by inoculation with such artificial cultures. Thus, after testing many kinds of virus and cultures from many sources, some of doubtful and others undoubted activity and purity; after inoculating by several methods once, twice, thrice or oftener in each case, with strong doses all at once, or several weak and strong at intervals; after trying gradual inoculation beginning with a mild virus and ending with a powerful one; after sacrificing many animals here and in the South, we feel glad; for we have, we think, partly conquered, and the people, our employers, may reap the great benefits that are sure to come if our future work gives the results promised.*

* I give in this bulletin our failures as well as successes.

"*Protective Inoculation of Cattle Shipped to Texas and Arkansas.*"*

"June 14th, six inoculated and six not inoculated head of cattle were shipped to College Station, Brazos Co., Texas, where they were put on pasture and attended to by Dr. Francis. The three kinds of virus used were not known to be positively reliable in any sense. Our experiments had not as yet given us a positive clue to its powers and effects. The elucidation of this double problem was one of the objects of this shipment. September 11th, shipped to the same place fourteen head of cattle, *i. e.* ten inoculated and four not inoculated. They were also put on pasture. The atmospheric temperature was exceedingly warm.† The results obtained, as given by report of Dr. Francis, dated December 19th, 1889, were as follows:

"*First Shipment.*—Of the six not vaccinated five died of Texas fever within three weeks, and the other was ill and recovered; of the six inoculated four died. Now, these inoculations had been practised once before leaving Columbia, and once in Texas, the virus being of a very *doubtful* nature, as before mentioned. Total per cent. of deaths of vaccinated stock $66\frac{2}{3}$, the non-vaccinated stock 83·3 per cent.

"*Second Shipment.*—Of ten vaccinated two died of Texas fever; of the four not vaccinated three died, and the others recovered after severe illness. Total death-rate among the inoculated or vaccinated stock 20 per cent.; among stock not so protected 75 per cent. The origin of the virus used for inoculation was manure, liver, blood, &c., and had been cultivated or prepared artificially. It will be seen that the last shipment was more successful than the first, although far from satisfactory. It remains to be said that the stock thus treated and exposed that did resist Texas fever did not do as well as stock of Southern origin kept on the same grounds. The subjects remained poor for awhile. July 5th, four inoculated cattle and four not inoculated were sent from Columbia to Helena, Arkansas, and there exposed on the grounds, under the care of Dr. Dinwiddie. August 9th, eleven head, six inoculated and four not inoculated, were shipped to the same place. Four different kinds of virus of unknown strength and power had been used as a logical deduction of laboratory studies, with a view to test the chances of finding a protective kind. The result of the two

* Inoculation and vaccination here mean the same.

† The inoculated cattle of these shipments were Missouri natives.

experiments was that *one died of Texas fever on the cars, the effect of inoculation;* twelve succumbed on the grounds (possibly two of these died of anthrax), and six are now living. From the latest report of Dr. Dinwiddie, I infer that the latter *were all* inoculated stock. However that may be, the results in a general way could not be considered encouraging. But when it is explained that nearly all the inoculated stock that survived these four shipments to Texas and Arkansas had been treated with virus of *similar origin and nature,* it gives hope that some good will come of this particular kind. Dr. Dinwiddie's report of much faithful work shows 100 per cent. of death of non-vaccinated, 75 per cent. vaccinated.

"*Inoculation in Houston, Texas Co., Mo., at the Kansas City Stock-yards, and at our Experiment Pens.*"

"July 19th, an outbreak of Texas fever of extensive character was reported at Houston, Texas Co., Mo. Dr. B. R. Harmon, then of the State Veterinarian's Laboratory, was deputized to attend to the matter. He remained ten days on the grounds and found that several car-loads of Southern Cattle had been brought into the county in April and July, and scattered over the unfenced lands to roam at large. Some fourteen head of the natives among them had died, and several were sick with Texas fever. Dr. Harmon practised inoculation with an artificial preparation of the germs of Texas fever on thirty-one head of cattle. They were left exposed with the Southern cattle on the infected grounds. All remained healthy, but it was reported that several of the unprotected cattle left with them afterwards contracted the malady and some died. This was only an incidental experiment during our regular investigations, and is not of itself sufficient evidence.

"*At the Kansas City Stock-yards.*—The work here was conducted by Dr. H. B. Adair, Deputy State Veterinarian, a skilful surgeon, and witnessed by P. D. Etue, Esq., editor of the *Kansas City Live Stock Indicator,* who manifested a great deal of interest in the undertaking and sacrificed much time to it. Dr. J. A. Walrath, of the Bureau of Animal Industry, was present also on several occasions. August 10th, six native heifers were placed in lot 13, block 20, which was free from contagion. They had never been exposed to Texas fever and were in good health. Temperature of the six averaged $101\frac{1}{5}^{\circ}$ F. before inoculation. Heifers Nos. 1, 2, and 3 were inoculated with an artificial culture of

Texas-fever germs furnished by me. August 14th, heifers Nos. 4, 5, and 6 were inoculated as directed by me with spleen and liver pulp taken from a case of Texas fever soon after death. This virus, unfortunately, contained some septic germs and caused some little trouble. During the next six days after inoculation the temperature of the first lot inoculated rose to an average of $102\frac{4}{5}^{\circ}$ F., and that of the second lot rose to an average of 104° F. August 17th, Nos. 1, 2, and 3 were re-inoculated with the same kind of cultivated germs, but of greater virulence. During the five days following this inoculation the temperature rose to an average of $103\frac{2}{5}^{\circ}$ F. Thus the first three were inoculated twice and the second three only once. August 22nd, both lots were examined, and the temperature for each was as follows:—*First lot* (inoculated twice), No. 1, $102\frac{2}{5}^{\circ}$ F.; No. 2, $103\frac{2}{5}^{\circ}$; No. 3, $103\frac{1}{5}^{\circ}$. *Second lot* (inoculated once), No. 4, $105\frac{1}{5}^{\circ}$; No. 5, 103°; No. 6, $105\frac{2}{5}^{\circ}$; Nos. 4 and 5 appeared sick. August 24th, the temperature had abated in in all six to an average of 103° F. The inoculation with spleen and liver pulp had produced swellings and slight abscesses at the points of inoculation—the brisket. This date all the *vaccinated animals*, together with three others, *Nos. 7, 8 and 9, not vaccinated,* were driven across the stock-yards bridge to the Kansas side, and there placed successively in lots 12, 6, and 5, block 32, occupied some time previously by Southern cattle that had proven their power of conveying Texas fever.

"The final results of this experiment are given by Dr. Adair as follows: 'Case No. 3, *inoculated*, died of Texas fever; case No. 4 died of septicæmia induced by the *inoculation.* Neither the symptoms nor the lesions found in *post-mortem* examination indicated Texas fever. (Microscopic investigation verified this diagnosis.) The remaining four, all vaccinated, remained healthy. No. 7, not vaccinated, died early of Texas fever. Nos. 8 and 9, also unprotected, both contracted it severely, but finally recovered. Thus, of the *six vaccinated, only one* contracted Texas fever, whilst the *three unvaccinated subjects all* became affected, and one died. During the fifty-five days of this test the weather was very warm. The cattle were kept in open pens exposed to the sun's rays. Their solid food consisted of hay only, and sometimes it was not good; consequently all of them became thin, and the trial was a most severe one.'

"*At our Experiment Pens.*—As mentioned already, inoculated and unvaccinated cattle were put in infectious pens 1 to 8 inclusive, August 17th and 27th,

"The following Tabulation shows the most Important Points of these Experiments at a glance.

Case.	Inoculated or not, and date of Inoculation.	Origin and activity of virus used for Inoculation.	Average temperature of animals from 1st to 5th day.	Lowest and highest temperature of the cattle, from the 10th to the 20th day.	Results after twenty days of exposure and later.
A	No		$101\frac{3}{5}°$ F.	102° to 103° F.	Died of Texas fever.
B	No		101°	$102\frac{3}{5}°$—$103\frac{3}{5}°$	Very sick, but recovered.
C	No		101°	101°—102°	Apparently well, always.
D	No		102°	102°—104°	Died of Texas fever.
E	Yes; July 20th	Spleen—weak	103°	103°—$104\frac{1}{2}°$	Fever diminished.
F	Yes; July 20th	Spleen—stronger	104°	$103\frac{2}{5}°$—103°	Not sick to show symptoms.
G	Yes; July 22nd	Spleen—weak	102°	104°—106°	Fever declined.
H	Yes; July 26th	Artificial cult.—strong	$104\frac{1}{2}°$	103°—$102°\frac{3}{5}$	Not sick, apparently.
I	Yes; July 26th	Artificial cult.—stronger	105°	104°—103°	Fever from inoculation, not sick from exposure.
J	Yes; July 26th	Liver—very strong.	105°	105°—$104\frac{3}{5}°$	Sick from inoculation, not from exposure.

"Thus, of the four not inoculated before exposure, two died of Texas fever, one was very seriously ill, and the other remained apparently well. Of the six inoculated none died, two were not sick, and the remainder sick mostly from inoculation, as explained in the result column. The subject of protective inoculation will be especially treated further.

"*Inoculation of Cattle Shipped to Private Individuals in the Indian Territory and Texas.*

"In November, 1890, after we had learned the lessons of the preceding experiments, an agreement was entered into between Dr. A. W. McAlester, of Columbia, Mo., and the writer, to the effect that forty head of high grade or thoroughbred Hereford, shorthorn, and other cattle were purchased by the doctor for his cousin, J. J. McAlester, of McAlester Station, Indian Territory, and that we inoculated them, and shipped them to the latter place, where they were scattered over infectious grounds on which the death-rate by Texas fever had always been so severe, even during the greatest part or the whole of mild winters, that Mr. McAlester, after repeated and fatal trials, had given up the importation of Northern stock. The process of inoculation was gradual, giving twenty drops of virus to each head every third day until four inoculations had been practised. Each successive virus was stronger than the preceding, and the last was very virulent. The animals were shipped next day after the last inoculation, and were unloaded at McAlester Station, December 1st, 1889, about two days after shipping. During the inoculation process the temperature rose from the average normal of $101\frac{2}{5}°$ F., to a fever averaging 103°. When they reached the Territory this fever had declined some, as proven by Dr. Grubbs, who registered the temperature for Mr. McAlester. The results of this trial are given here in the language of the purchaser himself.

"'Of the forty head bought and inoculated by you *only* one died of Texas fever some time since. A neighbour received from Missouri two cows and two yearlings not vaccinated, and placed them on practically the same ground at about the same time that mine were put on pasture, and every one of his died of Texas fever. I am of the opinion that this vaccination with the treatment you prescribed will save nine tenths of the cattle, particularly the young stock shipped to this climate. This has been an unusually warm winter. Most of the cattle are now scattered over the country and all doing very well but one, and he is doing fairly.'

"The usual death-rate of Northern cattle in the Indian pastures where these were exposed has always averaged 50 per cent., and continued its ravages in the winter, especially mild winters.

"*Deductions from Experiments.*

"1. That if Texas fever is, as has been written, of the obscure nature of malaria in man, it is nevertheless surely inoculable, and is due to an appreciable germ.

"2. That this germ or microbe, even when cultivated artificially, may be inoculated to cattle with dangerous effects.

"3. That susceptible cattle (*i. e.* of the North) may be purposely inoculated with virus of Texas fever, and thereby placed in the same relation with that disease as are the cattle born South, which become primarily inoculated from their mothers.

"4. That one single inoculation, mild or powerful, is not a sufficient protection against Texas fever, and that the virus must be of certain power and prepared purposely with the greatest care and by scientific methods.

"5. That inoculation with too strong virus, causing high fever, or positive serious signs of Texas fever, is not a sure protection, but instead is a dangerous practice and may kill stock directly, or cause such damage in the system that when exposed to the virus when thus suffering, or soon thereafter, the subjects gradually get worse and die—*never* having regained their strength.

"6. That periodical inoculation, beginning with a mild virus and ending with a stronger, is more rational as being more like the natural process of inoculation of Southern calves, and is in a large degree a protection against Texas fever.

"7. That possibly the safest method of inoculation is to complete it on Southern soil after shipment, providing that there be no exposure to the germs during the period of inoculation, particularly at the beginning.

"8. That the best results of inoculation thus far are obtainable when the greatest care and attention is given to the inoculated stock before and after it is exposed.

"*The Germ of Texas Fever.*—A malady due to a germ is simply one produced by very small parasites; microscopic organisms termed germs, microbes, bacteria, &c., which grow in the body at the expense of the tissues, blood, &c., and thereby cause various kinds of disorders, such as fever, nervous phenomena, and several other symptoms. Therefore the knowledge of the life of such germs is necessary to understand thoroughly the nature of the diseases that they cause respectively. However, the explanation of such biological questions is of more interest to science than to practical men; and as we are still investigating doubtful points concerning the life of the germ of Texas fever, and as we have much material of more immediate utility to the masses, I will write this time as briefly as the problem

allows on this particular point, upon which it is my intention to publish special articles, practical and scientific, some time in the future. As explained in the beginning of this bulletin, we have purposely abstained during our work from consulting any writer on Texas fever. Before writing this, however, I have carefully and conscientiously gone over the reports of the investigators who have studied Texas fever before us, and have compared the results with ours, in which we have much valuable positive and negative evidence.*

"In regard to the priority in the discovery of the germ I have this to say: it seems that almost every investigator who has used the microscope has seen it in one or more of the stages of its development, but none have fully realised its significance. Dr. H. J. Detmers and Dr. D. E. Salmon have, at the time, attached some importance to the forms that they respectively noticed, and Dr. Detmers has, I am informed, always had faith in his findings. He deserves credit for his tenacity to a just cause. The Bureau of Animal Industry, however, seems to have abandoned whatever significance its officers have attached to the figure-8 germs that they found in the bile, and which really is one of the appearances of the microbe in question, for not long since Dr Theobald Smith, of that section of the United States Department of Agriculture, published an interesting account of his latest researches, and claims that the disease is due to intra-globular forms not susceptible of cultivation, and that their effects are only on the red blood-corpuscles which they destroy. He has not succeeded in inoculating the disease. I myself have seen the germ of Texas fever in spleens as far back as 1886, but I did not then appreciate its value. But Dr. Frank S. Billings has grasped and explained better than any the significance of at least one form of the germ. He has understood much that investigators before him misunderstood, and has foreseen largely the possibilities and properties of the parasite.

"Judging from researches necessarily limited by time and circumstances, Dr. Billings concluded from his observations of the germs in tissues and culture, that in the mature form their longitudinal diameter is about twice that of their transverse, that they are very small, ovoid, and have rounded extremities with special affinity for stain. (Pages 75 and 76 of *Bulletin of Agricultural Experiment Station*

* While preparing notes for this, Dr. F. S. Billings kindly forwarded to me, unsolicited, some slides made when he studied Texas fever. I can only mention this favour at this writing.

of Nebraska, Nos. 7, 8, 9, 10, June, 1889.) It is true one finds the ovoid (and cocoid?) forms in the animal organisms and in cultures, but after investigating during two years a very large amount of animal tissues and fluids of various kinds, and after studying a great number of cultures, I believe that conclusion doubtful. The *small* ovoid seems only a period during the vegetation of the organism before complete maturity. From present indications I think the mature form is different and much larger, and perhaps the organism completes its life outside of the body. But I will let my readers judge for themselves. In analysing the liver and spleen of infectious Southern cattle we may find two or three forms, *i. e.* forms more or less ovoid which predominate and may be scattered, but are mostly grouped in masses in the *intimity** of the tissues and corpuscles; a few short rods around which may occasionally be seen an areola (a light shade), and long large rod forms, sparsely distributed here and there. If cultures are made from such material the ovoid forms elongate, become surrounded by a gelatinous capsule or areola, and break off into at least two short rods, or double and single bodies mostly ovoid in appearance, and they may be seen with a capsule. By special processes of staining it is possible to obtain the capsule and all in same body. It is also possible to get all these forms on one slide and have them all at once under the microscope; observe Fig. 1.† There may be seen the single and double (cocoid and ovoid) bodies, elongating forms, large rods, some showing the surrounding capsule, &c. This illustration is exact, and is from an absolutely pure and inoculable culture made from the bile of an infectious Arkansas cow—bile with which we afterwards produced Texas fever. It shows at a glance, and better than I could describe, the various forms which this germ assumes during its growth, and made apparent by staining. And now, if you will study all the figures, you will perhaps form an idea as to the adult form. In the figure from a photograph of bile with the bacteria that it contained will be

* This word intimity is perhaps not used in the English language, but it has a correspondent in French, and means about this: mingled closely within.—P. P.

† After writing the text I found that a pure culture from blood of an affected Missouri native bovine presented exactly the same appearances under the microscope as that from this culture from the bile of an Arkansas cow, consequently I concluded to use but one cut for both of these cultures. Unfortunately the necessary changes or explanations in the text were forgotten. Hence the conflicting statements here, with explanations accompanying Fig. 1. This plate is really from a blood culture.

seen forms which *perhaps* represent the truly adult stage as in the outer world. It is comparatively easy to get all the shapes and appearances that I have mentioned. To observe them all, one only has to study very carefully, by safe and sure bacterial methods and *for months*, the vegetation of the germs in different culture media and under various conditions, whether the origin was from Southern cattle of infectious grounds, or from Northern stock suffering from Texas fever, or from any reliable source. Perhaps he will be confused for a time in finding so many shapes and sizes, but presently he will get into the right groove, and will be able to trace the origin of every one, especially if drop cultures, and drops of blood (under proper care) of infected stock are patiently and long watched. The long or large germs found in fresh organs disappear gradually, and the smaller ones only are found in preserved specimens, especially those kept in alcohol.

"If one immerses in pure glycerine a fresh piece of liver of infectious Southern cattle, or of any Northern animal with the fever, in a month or more there may be seen on its surface fine white specks that gradually develop until they are roundish bodies as large as the head of a pin or larger. A section through the tissue will reveal the same condition of things within the organ. These granules (and neighbouring substances) contain crystals, and living inoculable germs of various appearances, but they are seemingly those of Texas fever. A way to find several forms of the germ is to fill a sterilised pipette of bile from the gall-bladder of an infected Southern animal, or better a Northern with the fever, seal it and let it stand for some weeks or months; gradually whitish granules and flakes will be deposited as in the liver, and forms may be noticed. Occasionally many appear stained brown, perhaps by the colouring matter of the bile. (Chemical analyses of these deposits are now under way by Professor Schweitzer.) This colour and the crystals mostly disappear in contact with acids. These substances are decidedly more prolific and pronounced in bile from an acute case of fever.

"It may be objected that there was some '*post-mortem history*' connected with our germs, our cultures, the liver, bile, and other specimens from which we form opinions. The fact is, we have taken the greatest possible care to meet this convenient objection, and we have had, generally speaking, the same results from infectious Southern cattle *killed* in Texas, in the Indian Territory, in Arkansas, those brought here and *killed* purposely; from natives with the

fever *killed* purposely, or immediately after death had occurred, and from inoculated cattle, pigs, and other animals. Identical cultures were obtained from *infectious* animals of the South, and *diseased cases* in the North, in the field and at the laboratory. As to those granules, as will be seen further, we have succeeded in inoculating them to cattle and other animals, and produced seemingly the forms of Texas fever germs.* We have not had the above results with liver and bile of Northern cattle *not* suffering from Texas fever, or exposed to its virus. As hinted, perhaps the parasite passes only a phase of its life within the animal body, and completes it outside, as was suggested by Dr. Theobald Smith, of the Bureau of Animal Industry, in the article already referred to, and entitled 'Preliminary Observations of the Micro-organism of Texas Fever,' contributed to the *Medical News*, Philadelphia, December 21st, 1889. In the kidneys, lymphatic glands, blood, and urine the germs are usually in some small forms. As Dr. Smith states, the red blood-corpuscles become affected. In cases of fever in Northern stock, small forms adhere to the blood-corpuscles, penetrate into them, and cause them to appear crenulated, irregular in shape, lumpy, knotty from the parasitic bodies within—perforated, distorted, in fact. They seem to perish so rapidly, that in a few hours, or in a few days at most, the blood has lost much of its solid elements, becomes more watery, and hæmoglobin passes into the urine.† But it is incomparably less severe in Southern stock. In their blood we find the same germs in lesser number, and the blood-corpuscles are in part more or less diseased too, but they resist, as is evidenced by the apparently good health of the subjects; however, their livers and certain other organs are full of the parasites. The tissues and blood of an infectious Southern animal are much like the tissues and blood of a case produced by inoculation of *most of ordinary cultures,* or other mild virus. Dr. Smith, in the article quoted, formulates the following definition of Texas fever:—'It is essentially a blood disease. There is a continuous or paroxysmal destruction of red blood-corpuscles due to an intraglobular parasite, and the disease results mainly from the incapacity of the internal organs, primarily the liver, secondarily the spleen and kidneys, to transform and remove the waste products resulting from such destruction.'

* I do not yet consider these inoculations positive evidence, however.—P. P.

† The urine becomes bloody in appearance.

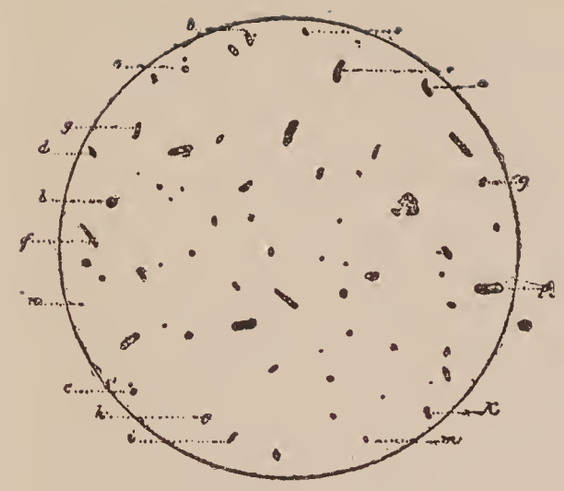


FIG. 1. × 2000.

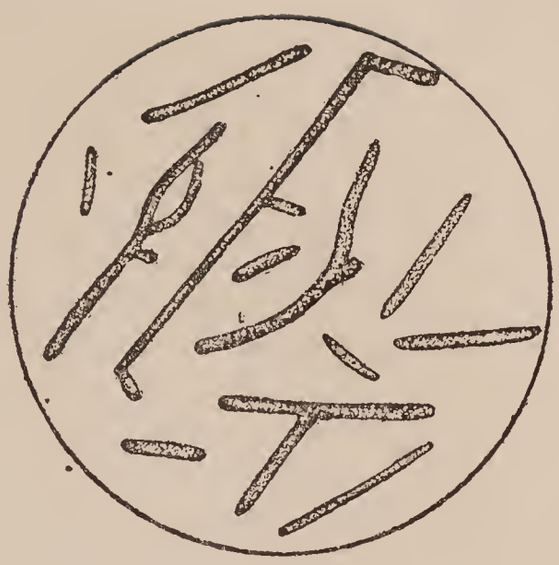


FIG. 2. × 1000.

FIG. 3. × 1000.

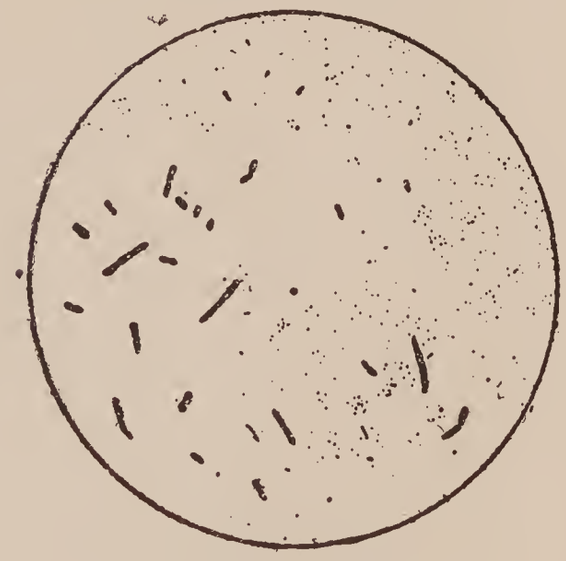


FIG. 4. × 1000.

FIG. 1.—The microbe of Texas fever at various stages of its development, from a shaken liver-broth culture pure, one day old (that became inoculable). Origin from the blood of a native suffering from Texas fever.

Letters *a*, *d*, *h*, point to the SMALL OVOID STAGE described by Frank S. Billings as the adult form; the letters *b*, *i*, *g*, present ovoid forms elongating and spots within; the letters *o*, *c*, as well as the *b* pointing to a small circle to the left of the figure, show the cocoid appearance, or perhaps the same forms as the preceding, standing on end, and thus presenting a view of the top of one extremity; *m*, fine new forms to develop in the ovoid represented by *a*, *b*, *h*; *f*, *r*, germs sufficiently developed to show by dots what seems at this stage to be the ends of new ovoid forms within; *p*, still further development of a mother cell showing two fine ovoid bodies within, which are to be freed, and appear then as shown by letters *m*, and later *a*, *b*, &c.; *e*, *k*, figure-8 germ—an appearance probably identical with Dr. Salmon's bacteria of Texas fever.

FIG. 2.—Forms in a photograph of old BILE of a cow killed when suffering from Texas fever. Some may be crystals (?), but I think most represent the adult forms in the outer world. Some forms in such bile, not shown in the cut, had a flagellum or prolongation at each end.

FIG. 3.—Germs from a culture in beef broth; very well developed; proved inoculable.

FIG. 4.—Germs from liver of HEALTHY Arkansas steer killed purposely; proved inoculable; furnished the culture represented in Fig. 3.

"From our work, I could scarcely admit such an exclusive definition. The germs being present outside of blood-corpuscles, in the liver, spleen, lymph-glands, kidneys, *as well as* in the blood of Southern infectious cattle and diseased Northern stock, and growing more or less in all of these organs and fluids, indicate a modification of this conception. Since around, on, and in the blood-corpuscles, as Dr. Smith has well said, are found almost only cocoid and ovoid bodies, single or in pairs, in greater or lesser numbers, is not this phenomenon an attempt on the part of nature to destroy the parasites at this phase of their life, through the action of the blood-corpuscles, rather than a docile submission on the part of the corpuscles to the voracity of the germs? I am inclined to consider the ravages of the germs more extensive. Indeed, the traces of these are plain in other parts than the blood, even in infectious Southern stock. In a sudden invasion of cattle unprotected by the immunity contracted South, or by artificial inoculation, the parasites develop with wonderful rapidity in many organs, which become impaired, and thus the nourishment on which the blood depends for rejuvenation becomes improper before the germs have overcome the blood-corpuscles. The microbes seem to win the fight, because other parts of the body had been previously weakened. We made some experiments to solve this problem. 1st, we produced Texas fever by *feeding* virus; 2nd, by inoculation *subcutaneously;* and 3rd, by *intravenous* inoculation. In the first case the germs appeared in the blood in sufficient quantity to master it only at a late hour—after the liver and spleen, &c., had been invaded and much impaired in their physiological functions. In the second case the germs appeared in the blood in a few hours, in large quantities, but most of them disappeared shortly, and four or five days later only a few germs and a few diseased corpuscles could be found; on killing the subjects, however, they were found plentiful in the liver and other organs. In the third case, in giving a moderate dose the animals became violently ill, and could scarcely rise; the blood had more germs than corpuscles; many of these perished, but eventually the germs became scarcer and scarcer, the distorted corpuscles also disappeared, and yet the subjects, when killed after they had sufficiently recovered to regain their feet and eat, their livers and some other organs still harboured millions.

"Like Billings, I have found the germs motile but only in certain forms. In drop cultures, as well as in infected fluids or pulp from diseased subjects purposely

killed, I have found this to be the case. They roll on themselves, change place under the microscope, advance, bend to and fro, try and shake themselves loose from their capsules, &c.

"The large forms in old bile sometimes show a slight waving motion. The spherical, ovoid forms and short rods are often in zoöglea, both in fluids and in the liver. When such zoöglea are in drop cultures there may be a kind of slow bending, slow shaking motion on the part of some of the organisms to free themselves from the mass. The same thing is noticeable in cases of new cells trying to free themselves from the surrounding gelatinous matter of mother cells. A flagellum has been noticed at the extremities of some germs highly magnified. That appendage is perhaps the motor apparatus.

"Before closing this article I sincerely ask my readers to kindly examine all the illustrations and read their explanations. They have much significance concerning the nature of this micro-organism. As stated, we are still engaged in studies to sift the biology of the forms mentioned in connection with our investigations. Next year we hope to write in a more positive and more scientific line.

"*Deductions.*—1st. That the germ of Texas fever is susceptible to many changes during its vegetation.

"2nd. That the spherical, ovoid, and other forms, which several authors have seen, represent so many different periods in the life cycle of the parasite, or were different appearances due to different staining, including or excluding the envelope, and none of them separately could be sufficient to prove the identity and form a complete history establishing positively the discovery of the true nature of this micro-organism.

"3rd. That in the more mature stage the germs vary in size, some having measured 4 and 5μ in length, and 1·7μ in width; and that in the transitory ovoid stage the dimensions may vary from 2·5μ in length by 1·5μ in width to ·3μ by 1·5μ.

"4th. That probably the microbe passes only part of its existence in the animal body, and completes it in the outer world.

"5th. That the modes of reproduction, the nature of its growth, and its various forms studied in its tissues, fluids, and cultures, indicate an organism of the bacillar class, though possibly the adult stage in the outer world is akin to the form named cladothrix.

"*Artificial Cultivation of the Germ of Texas Fever.*—It

is not my purpose to enter here into any scientific explanation that could not benefit those for whom this bulletin is written. I hope to give more details later with the biology of the microbe.

"For the benefit of those unacquainted in the premises I will say that artificial cultivation of germs means simply a process by which they may be reproduced at will in vases, test-tubes, or dishes, just as seeds may be sown and plants reproduced and grown at will in a hothouse, at any time and during any season, even though the place of cultivation be foreign to the natural habitation of the plant. The disease germs are generally considered little plants, and artificial cultivation is one mode to grow them. When an animal or man is ill from any malady due to germs it means that the germs in question are growing in that individual at the expense of the tissues, blood, &c. In cultivating disease germs one substitutes an artificial nourishing media for the animal or other natural food.

"No part of our work has offered more and greater difficulties than the artificial culture of the germ of Texas fever. Beef broth peptonised, solidified with agar-agar or gelatine, or in a liquid state; blood serum, egg albumen (Tarchinoff's), amniotic water, artificial lymph, liver broth, potato, and several other media have been tried. We have found that they develop best in a mixture of artificial lymph that I prepared with liver broth, which Mr. Evans succeeded in keeping in a semi-solid and transparent state.

"Pure cultures can be obtained from the liver, spleen, kidneys, &c., of *Southern cattle* of the *infectious districts*, or from their *calves before* or *after birth*. There need be *no post-mortem history about them*. Simply go South, kill the subjects, and with the greatest care possible inoculate your cultures by proper and safe bacterial methods, or take the germs from such organs of a Northern animal suffering from the fever. Or, if you prefer, you may find them, but *less virulent*, in the urine and fæces.

"Pure cultures can also be obtained from the blood of such cases, but more rarely, and with greater difficulty. At some periods the germs seem to have little activity in the blood, and a particle of blood on a needle, thrust into a gelatinous mass, does not always cause a growth. However, we have succeeded in getting pure and inoculable cultures by making an incision in the jugular vein or carotid artery, inserting the point of a specially contrived test-tube, breaking it inside of the vessel, and allowing a drop or more to run into the tube and mix with the semi-fluid culture media.

Cultures from blood have developed the *same forms* as the germs found in the liver and other organs, or found present in cultures therefrom.

"*Transmission of Texas Fever.*—As may have been gleaned from the preceding pages, there are many sources of contamination in this disease. Waters, soils, manures from the South, urine, bile, liver, spleen, kidneys, &c., of infectious Southern stock have been mentioned as being capable of conveying the fever. That is not all. We have found the parasites also in *ticks bloated with blood of infectious cattle.* So this must be added to the list of sources. But from all these origins there seems only one principal mode of infection in the natural condition of life, that is, *by ingestion.* I mean that the cattle swallow the germs, and thus get the disease. It may be possible that germs deposited in dusty roads, or mixed with the dust raised by the winds, are inhaled, breathed by susceptible stock, and the malady thus induced; but such is certainly not the usual way.

"These facts will satisfy, at least in part, the many opinions on the question at hand, and perhaps will help to clear the obscurity prevailing in all minds, and which, I presume, caused Dr. Theobald Smith to write as follows in his article already quoted:—'As to the external character of the disease, we have *still to learn how* Southern cattle carry the disease germs while they themselves are immune; how the germs multiply on the pasture, and *how* they enter the susceptible organisms of the Northern cattle, and *whether or not they are* eliminated from the diseased body to become a *fresh centre of infection.*'*

"At this writing I would not venture to give details as to the actual vegetation of the germs on the grounds, although I might be pardoned an opinion based on many laboratory cultures and some observations of other kinds. But, as we are engaged in researches in that line, I leave the point for another time. Sufficient it is to say that germs excreted from off the body of Southern stock are *not at once* capable of much damage, but must first vegetate, thereby becoming virulent, whilst the virus from tissues, for instance, is more readily inoculable. Virus excreted by diseased Northern cattle is still weaker than from the Southerners, and becomes virulent outside after a longer time.

"Texas fever is transmissible, not only from Southern stock to susceptible Northern cattle, but under favorable

* The italics are mine. Our experiments furnish answers to the Doctor's remarks, in part at least.—P. P.

circumstances is inoculable *between Northern natives*, although, in the ordinary course of things, *in our climate* transmission does not occur. We have inoculated native Missouri cattle with spleen and liver pulp from *other diseased natives*, and produced typical cases of Texas fever, but it took large doses of virus. The rapidity of the course of the malady depends much on the origin and age of the virus. It was more rapid from old pulp kept in warmth and properly preserved than it was from virus of fresh matter, and it seems impossible to cause severe *Texas* fever with *fresh* urine, whilst the same exposed to warmth awhile becomes dangerous. We have succeeded also, though with great difficulty, to induce the disease in sheep, guinea-pigs, white mice, white rats, and very rarely rabbits, kittens, and swine. The germs may be reproduced by inoculation of liver and spleen pulp in any of these subjects, but the quantity must be large, and the gross typical spleen lesions are not always to be found. Indeed, the *typical* spleen enlargement and softening, and the bloody urine in a case of Texas fever produced by inoculation are not always present, *nor* are they *always* present in ordinary accidental cases in cattle. It depends largely on the virulence of the matter inoculated, the atmospheric temperature, the susceptibility of the subject; and the virulence depends on the generation of, and the influences on, the germs outside, after their passage through one animal body, and before their reception by another individual. The very act of cattle eating fresh germs that have *just* been deposited on the ground by a Texas cow, for instance, is not necessarily followed by perceptible fever. We have tested this, and found that both on the grounds and in artificial cultures the first generation (or generations, perhaps) coming from virus just excreted from the animal body are not dangerous. It seems that the parasite has a *resting* period after being thrown out, during which its virulence is very mild; and then the extreme virulence will come after several weeks if the germs receive sufficient warmth and moisture. We have seen in this writing that native Missouri cattle exposed with Southern stock immediately on their arrival here, in a pen of a few square feet, where they must swallow the parasites while eating, did not show fever before about a month, and in cases where those pens were shaded it took longer still. In those cases the germs were brought here by Southern cattle, and had to recuperate on our soil; it is the same thing when the disease is brought accidentally anywhere. Now, in cattle exposed in *Arkansas* and *Texas*, where the germs are *always* on the grounds, and

consequently are already virulent, the animals die within an average of *twelve days* from date of landing during the warm seasons. Reports from Drs. Dinwiddie, of Arkansas, and Francis, of Texas, show that our unprotected stock exposed there died within ten to fifteen days. Thus it takes once or twice as long for our native Northern stock to die of the fever when the germs are brought to *our* pastures by Southern cattle and dropped with manure and urine, as it takes when exposed to them on the *Southern soil itself*, where the parasites receive almost constant warmth and sufficient moisture, and are, therefore, always virulent. Germs artificially cultivated give results on the same principle.

"Investigators who have pursued researches concerning Texas fever seem to have expected, by inoculation, always the typical lesions of the malady, as usually found when it originates by accident and runs an acute severe course. This is surely an unreasonable demand. One must allow for degrees in this disease as in any other. As stated above, the softness of the spleen and the bloody urine are not always present in accidental or purposely induced cases. It is simply the same malady with a lesser or greater degree of lesions. This is not the place to discuss this pathological question, however. I merely desire to draw the attention of the readers to the fact that in producing Texas fever by inoculation, if only mild lesions are produced, providing that they are the same in character as are those of a typical case, that they are produced by the same germ, that the same germs are found in both, that the cultivated germs of both cases are alike in forms and mode of vegetation, that inoculations practised with germs of animals rendered ill by inoculation cause again the growth of similar germs and the advent of lesions of identical character, the proof is *sufficient*. In inoculating Texas fever one must always remember the peculiarities of its virus, its many forms, weak one day, stronger later on, &c.

"The following tabulation of part of our inoculations speaks for itself. It is selected because of the variety of the virus used and the many sources. All the inoculations not otherwise specified were hypodermic and mostly in the tail.

"Inoculation of any other animal than cattle has been found difficult. It always took large doses. Many fruitless, a few successful, attempts were made in the course of our experiments. Still the following tabulation does not give all that we have on record, but shows a sufficient variety for our purpose:

Inoculations of Cattle at Laboratory, &c.

Date of Inoculation.	Animals inoculated.	Kind of Virus and Record Marks.	Average Fever within Five Days.	Results.	Microscopical Revelations, *Post-mortem* Appearances and Remarks.
1889.					
June 29	Red steer	Vaccine from urine of Texan	103° F.	Sent to Arkansas; lived	—
„ 29	Red heifer	Vaccine from manure of Texan	103°1-5	Ditto	—
July 6	Red hornless heifer	Germs from ticks	102°3-5	Contracted fever in Arkansas	Lesions of Texas fever. Had previously in blood, germs produced by inoculation from the ticks.
„ 20	Small red heifer	Vaccine from spleen of native	103°2-5	Exposed to fever; lived	—
„ 20	Spayed heifer	Ditto	103°	Ditto	—
„ 26	Roan heifer	Culture I4	103½°	Ditto	Germs found in the blood taken from the ear. Corpuscles mildly but typically impaired.
„ 26	Red heifer	Culture L3	103°3-5	Ditto	—
„ 26	Red heifer	Vaccine from liver of Arkansas cow	103°	Ditto	Found the germs in drops of blood; corpuscles distorted.
Aug. 9	Heifer	Strong virus from liver of Texan	104°1-5	Died on car	Mr. Hampton pronounced it Texas fever. It was produced by inoculation.
„ 15	Long-horned cow	Fed potato culture U6	106°	Died August 22	Typical case of Texas fever; soft spleen, bloody urine and the germs.
„ 16	Small spotted heifer	Intravenous inoculation U6	—	Died August 16	In a few hours the blood was mastered by the germs. Same culture that caused preceding death.
„ 16	Heifer, right horn broken	Native liver and spleen pulp	105°3-5	Died August 24	Typical case of Texas fever. The germs present.
Sept. 5	Big-jaw steer	Culture BT3	103°	Sick; killed September 20	Mild lesions of Texas fever. The germs present.
„ 5	Old cow	Culture U6′	103°1-5	Recovered	The blood presented the germs, and the corpuscles were typically diseased.

Oct. 3	Cow No. 5	Culture 9½ IN VEIN	104°	Exceeding ill; recovered	Blood full of Texas fever germs for several days, gradually disappeared.
„ 16 „ 19 „ 23	Forty-one bulls	Mild and strong vaccine	104°	Some staggered; forty exposed Indian Territory; thirty-nine lived	Cattle of J. J. McAlester. Germs in the blood as inoculated, and the blood mildly modified, as in Texas fever.
Dec. 28	Heifer	Vaccine virus weak ABM	103°	Slightly ill	Germs in blood and corpuscles impaired as in Texas fever.
„ 31	Calf, four months	Culture XY′A	102°1-5	Very slightly ill	Germs present in blood, which is clearly though mildly affected.
„ 16 „ 21 „ 23	Sixty-five head cattle	Very strong vaccine, large doses	105°	All ill; five deaths	Characteristic cases of Texas fever.
„ 24	Thirty head Herefords	Graduated vaccine	103°	Sent to Texas and lived	Cattle of Mr. C. D. Foote.
1890.					
Jan. 17	Red roan heifer	Culture AM′ VENOUS inoculation	102°3-5	Very sick	Typical germs and lesions of Texas fever in blood.
„ 17	Little red steer	Culture AM′	103°	Exceedingly sick; killed	Germs of Texas fever in blood, bile, liver, &c.; lesions in tissues mild, but characteristic.
„ 17	Old cow	Culture AM′ in VEIN	103°1-5	Ditto staggers	Germs found in blood, which is much affected, typically.
Feb. 13	Heifer	Old manure moistened, &c.	103°1-5	Weakly	The blood and corpuscles show the germs of Texas fever.
„ 13	Stall No. 3 heifer	Culture P. A′	103°	Ill and weak	Killed within three days, and germs of Texas fever found. Typically distributed in liver, spleen, blood.
„ 13	Stall No. 4 steer	Culture FA3 from ticks	103°1-5	Weakly	Blood analysed and found to contain the germs, as inoculated. Corpuscles distorted.
„ 13	Steer	Granules from liver of Southerner	102°4-5	Slightly ill	Texas fever germs found in blood.
Mar. 20	Cow	Granules from bile of native	102°4-5	Indisposed	Corpuscles distorted, &c. Germs in blood and affecting the corpuscles.

Inoculations of other Animals than Cattle.

Date of Inoculation.	Animals inoculated.	Kind of Virus used and Record of Marks.	Results.	Microscopic and *Post-mortem* Appearances and Remarks.
1889.				
July 10	Gopher	Liver of Arkansas steer	Seriously ill; staggers	Germs developed locally, then generalized; subject recovered
„ 10	Black guinea-pig	Ditto	Died August 12	Germs of Texas fever found in blood, liver, spleen, &c.
„ 11	Yellow guinea-pig	Culture A3 of Texas cattle urine	Ditto	Germs similar as found in preceding cases and in same organs.
Aug. 2	White guinea-pig	Plv. spleen of native cattle	Apparently ill	Recovered.
„ 15	Black guinea-pig	Culture U3	Died	*Post-mortem*, unfortunately, missed until too late.
Aug. 16 to Sept. 3	Thirteen different rabbits	Different fresh and old cultures	Some slightly ill; none seriously	Occasionally corpuscles of the blood found diseased; somewhat crenulated.
„ 4	Rabbit in cage 11	Large dose, culture BO3	Died September 7	Found germs of Texas fever in liver, spleen, and blood.
„ 5	Guinea-pig, cage 2	Culture D2	Slightly ill	Found germs of Texas fever in blood.
„ 9	Six-months' ordinary pig (swine)	Liver of native with Texas fever	Died September 13	Lesions in liver and blood as those of Texas fever; same germs; they produced good cultures. See figs.
Oct. 1	Black kitten	Culture $9\frac{1}{2}$, from native cow	Died October 2	Germs found in blood, liver, &c., as those of Texas fever.
„ 11	Two small white mice	Culture CF4	Died October 13	Liver enlarged; blood, liver, and spleen had Texas fever germs.
„ 18	Two white mice	Culture D‴	Exceedingly sick; one killed Oct. 19, other died Oct. 20	Germs and lesions similar to those of Texas fever; spleen not enlarged, but gorged slightly.
„ 18	Ditto	Culture D13	One died October 19	Same lesions and germs as in preceding case.
Dec. 28	Three white rats	Cultures ABM′, X″, A. $9\frac{1}{2}$ A	All slightly ill	Germs found in their blood as in Texas fever.
Feb. 13	Two sheep	PA2 and PA3 in thigh	Decided lameness and illness	Ditto.
„ 13	Two white rats	Ditto in tail	One died February 15	Both have germs of Texas fever.

In all the inoculations mentioned above it was possible to identify the germs satisfactorily, and then make, from various specimens, cultures that became virulent and produced *in cattle* the same germs, the congestion of the liver, the distorted blood-corpuscles, &c., as occur in Texas fever.

"*Deductions.*—1st. That susceptible cattle contract the disease generally by swallowing the germs thrown out with urine, manure, &c., and that the breath does not cause it.

"2nd. That the germs, after passing through the animal body, are not ready to cause disease, but take some time to become deadly, consequently the germs spread in the usual way on Northern grounds must first recuperate virulence, *unless* they were brought from the South in *old manure and old urine* adhering to the feet.

"3rd. That ticks full of blood from infectious Southern cattle may, it seems, scatter the germs on our lands, though ticks *of themselves cannot* convey the disease.

"4th. That the disease is inoculable from native to native, and would be transmitted between them if our warm seasons were extended enough, and if our frosts were lighter.

"5th. That the malady is inoculable in a mild form to other animals than cattle, such as sheep, pigs, guinea-pigs, white rats, white mice, &c.

"6th. That in all animals inoculated the germs of yellow fever, and the most truly characteristic lesions that they cause, are reproduced in a more or less pronounced form.

"*The Principle of Immunity—how Texas Cattle carry the Germs of Texas Fever, and yet remain apparently Healthy; Vaccination.*—There are many theories advanced concerning the principle underlying immunity conferred by inoculation, vaccination, or an attack of disease. Smallpox is prevented by one attack, or by vaccination with cow-pox,* during the existence of which the system is rendered proof against smallpox for a *certain period;* charbon is prevented *for a certain period* by one attack accidentally contracted, or purposely inoculated in a mild form; black-leg is prevented just the same way, and so are several other affections of a specific character. Texas fever we found to be preventable on the same line. As mentioned, immunity, however, exists in any disease only for a time—smallpox for several years, black-leg for several years, charbon for a few months, Texas fever for a few months, &c. In our experiments we found, as my readers have learned, that the Texas fever germs are always living in the bodies of the infectious Southern cattle, and yet these remain apparently healthy. Thus, whilst the germs grow in them, they are proof against an acute attack of the disease. But if infectious Southern cattle are kept *North*—say in Missouri—for about a year, and then exposed to Texas fever again, they will contract

* Some renowned authorities claim that cow-pox and horse-pox are identical.

the disease and may die. So they have immunity, or, in other words, are proof against the disease only for a short period—a few months or a year at most. This has been verified by actual shipments near Sturgeon, Mo., three years ago, and by others throughout the State. The fact that Southern cattle which are proof against the disease have, nevertheless, the germs of it constantly growing in their systems, shatters a few theories of a general character, attempting to explain by what phenomenon the body actually becomes vested with power to resist disease. In Texas fever, as perhaps in several infectious diseases, it seems only a *question of tolerance*. The body becomes accustomed to the action of the germs and its products, just as one becomes accustomed to take morphine, or to the climatic influences of fever and ague.

"Now, as to how Southern cattle bring us disease, whilst they seem free, it is very simple. They have been naturally inoculated or vaccinated from their mother's womb before birth, and then have been subject to the influence of the germs all their lives. Thus they can just as safely carry the germs on them, in their bowels, &c., as a man, having had smallpox, or having been vaccinated, may carry the germs of smallpox on his person in any way, shape, or form. Indeed, he might swallow them with impunity to himself, and yet might distribute the virus and cause smallpox in others. Now, concerning the transmission between natives—that rests solely on two conditions—the nature of the germs and the nature of the climate. It has been seen that the germs on Southern soil, where it is always warm more or less, are always deadly except during cold times, and that cattle exposed there die within ten or twelve days. The same germs gathered on Southern soil and brought here in a glass jar, say, have the same effects. But if Southern cattle bring us the germs in *their bodies, i. e.* in their bowels and urine, the condition is changed. In such cases the germs deposited on our grounds remain harmless between one and two months at least. During that time, exposed to sun heat and sufficient moisture, the virulence is regained, and *then* exposed susceptible cattle sicken and die. Now, when our natives get the fever, they deposit the germs on the ground, just as the Southern stock; but before the germs can gain virulence the cold and frosty season of the North *is on them*, and modifies and even destroys their activity. Some experiments, not given in detail in this bulletin, show, as all observations do, that *cool weather* retards the *growth* of the germs, that *freezing-point* for *several hours* intercepts the

vegetation to adult forms, and *long frosts* modify these even to destruction. The reason, therefore, that in the ordinary course of things native cattle suffering from Texas fever do not transmit the disease to others is simply because the duration of our warm season is not long enough to allow the germs to grow in virulence after passing through the animal body. By inoculation and cultivation of germs from such stock we found this to be the truth, and those of my readers who have had the patience to read this carefully have perhaps already come to this conclusion themselves.

"*Conclusions.*—The conclusions that we have arrived at from the facts developed by *all our experiments* and researches are given here in direct reply to each proposition that we formulated when we began our work.

"1st. The Texas fever germs may be found in some surface soils, grasses, and pond waters of the infectious districts of the Southern States.

"2nd. The virus is found in the liver, spleen, lymph-glands, kidneys, blood, bile, urine, and fæces (fresh droppings of manure), and is transferred to the North chiefly by the urine and manure.

"3rd. Ticks and the feet of cattle are capable of carrying the germs to distant lands.

"4th. The period of *incubation, i. e.* the lapse of time *between* the *moment* that germs are taken into the *body* by susceptible cattle and the *appearance* of the disease, is between eight and twelve days only. Cattle may be *exposed longer* and not become affected, but this depends on the weakness of the germs in conditions demonstrated by our field tests and inoculations.

"5th. So far experiments indicate that about *thirty days after leaving the Southern infectious soil* the Southern cattle are not dangerous; consequently, if they were kept that long in quarantine North of the fever line, they could then be safely scattered among Northern stock. More experiments are necessary on this point.

"6th. The cheapest mode that we know now to disinfect cars and yards is by quicklime, corrosive sublimate solution, or steam; but here again we mean to experiment further. Chloride of lime has little value except to impart a pleasant odour.

"7th. The means to disinfect Southern cattle alive, and render them harmless before shipping North, is not settled, and we shall experiment with that end in view this year.

"8th. Inoculation was at first very unsuccessful, but afterwards proved beneficial. Properly inoculated cattle

were shipped and exposed South with *little or no* damage. More experiments are needed on this point.

"9th. Other animals than cattle may, under certain conditions, when shipped by rapid transit, bring Texas fever North, and one good observation indicates that a shipment of horses has done so in the State of Missouri.

"10th. During favorable weather, virus spread in the North with fresh manure and urine directly from Southern cattle becomes virulent in about thirty days (and perhaps occasionally less) during the warm months, and remains virulent until decidedly cool weather.

"11th. Under the circumstances explained in this bulletin, Northern cattle suffering from Texas fever may communicate the disease to other Northern natives, though this cannot occur in the ordinary course of things in Missouri, or anywhere North, because cold weather arrives too soon to allow the vegetation of the germ to virulent maturity.

"12th. Calves born South become inoculated or receive the germs of Texas fever directly from their mothers before birth, and then continue to resist the germs—first, because of this *natural* inoculation; and second, because of receiving the virus gradually, perhaps in the milk, and then when they begin to eat or nibble on grass."

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of this Association was held at the County Hotel, Newcastle-on-Tyne, on Friday, August 29th, when the following gentlemen were present:

Members: Professor Williams, Messrs. J. W. T. Moore, J. Aitken, C. Stephenson, D. Dudgeon, F. Finney, W. Wheatley, J. Gofton, G. Mitchell, A. Chivas, G. R. Dudgeon, J. B. Nesbit, J. E. Tudor, W. Ashton-Hancock, J. E. Peele, A. Peele, G. Elphick, and D. Macgregor.

Visitors: Messrs. T. Aitken, W. Dotchin, J. Arup, T. Bowhill, and R. H. Potts.

The President (J. W. Moore, Esq.) occupied the chair.

The minutes of the previous meeting were taken as read, and adopted.

Letters of regret for not being present were read from Professors Walley, McCall, and McFadyean, and Mr. T. Greaves.

The following gentlemen were nominated as members of the Association by Mr. D. Dudgeon:—Messrs. J. Aitken, D. Macgregor, and T. Aitken, of Newcastle-on-Tyne.

Alteration of Rule VII, so as to fall in with the proposals of the

recent conference of representatives of the various veterinary medical associations held in London. The rule reads as follows:—"That the ordinary meetings of the Association be held quarterly, viz. on the last Fridays of the months of February, May, August, and November, at three o'clock in the afternoon, in Newcastle or district, as selected by the Association."

Mr. D. Dudgeon, who proposed the alteration of the dates of meetings to the third Friday, instead of the last Friday as at present, said there was, in his judgment, absolutely no reason that could be urged against the alteration of the date, and he could state positively that there are members who cannot attend the meetings on the dates as at present fixed, but who could attend on the third Fridays.

Mr. Dudgeon's motion was seconded by Mr. Mitchell.

Mr. Nisbet moved an amendment to the effect that the rule should remain as at present, and in doing so expressed the opinion that the Royal Counties Association had acted in a somewhat high-handed manner in the matter; and although he personally would prefer another day to Friday, he would certainly move that the rule be not altered.

Mr. Stephenson seconded the amendment.

The *President* then read some correspondence that had taken place between himself and Mr. Kidd on the subject, and stated that, although he was willing to alter one of our dates if the Royal Counties Association did the same, he would not vote for Mr. Dudgeon's motion.

Mr. Gofton thought it was a matter hardly worth quibbling over, and suggested they could not do better than agree to Mr. Dudgeon's motion, and have the third Fridays.

Professor Williams thought it would be as well to accept the dates fixed by the conference.

Mr. Dudgeon wished to point out that it was impossible for any gentleman to attend both meetings if he wished to do so at present.

Mr. Dudgeon's motion was ultimately carried by a good majority.

Mr. Gofton said, with reference to the Defence Association, that he did not wish to find fault with the existing one, but he would certainly like to see it made more popular and more favorable to the members of the profession generally. The present methods of the Association were a farce, and he suggested a conference of the representatives of the several veterinary medical associations and the Defence Association, to see if some modifications of the existing rules could be arranged. This subject was ultimately dropped before anything definite could be arrived at, owing to Professor Williams having to catch a train earlier than he anticipated.

Professor Williams then introduced the following subject for discussion:

The Education of Students entering the Profession.—I consider the question of the professional education of the student of veterinary medicine to be of the highest importance, and I therefore do not hesitate to introduce it for the consideration of the members of this Society. It must be admitted that each candidate

for admission into our profession should be well grounded in English, by which I mean grammar, writing from dictation, arithmetic, history, geography, literature, and composition, and should also be, to an extent, acquainted with mathematics. Now, my idea of the examination test is this: Select say twelve subjects, and make say five or six of them compulsory, but giving the candidate the selection of those five or six subjects, and let him not pass unless he has obtained 33 per cent. Now, as to Latin, French, and German, you are aware that the Council have the intention of making Latin a compulsory subject, but the reasons given are not clear. It is very true that a knowledge of Latin is of real value in the culture of the mind, but as quoted by Mr. Atkinson, in the *Record* for August 16th, from Huxley, "there is nothing in common between such high intellectual discipline and the progress by which young boys are ground up to the pitch of being able to construe some easy Latin." Then Mr. Atkinson says it is quite possible to find men ignorant of Latin with as high a standard of mental culture as we require. Then, again, we have Mr. Gladstone speaking upon this very subject in Flintshire:—"In my opinion classical education is in itself the very best for all those who have a certain tendency towards it, and those whose circumstances are such as will enable them not to be content with the merest rudiments, but who will proceed to the point at which they will realize some solid attainments. Terrible errors have undoubtedly been committed in the past, and in the past I include the days of my own experience, in endeavouring to thrust the Classics down the throats of everybody of a certain rank, quite irrespective of capacity and circumstance. I always bear this in mind, that the main purpose of education is to make the human mind a supple, effective, strong, available instrument for whatever purpose it may be required to be applied to." Now, gentlemen, the question is asked by Dr. Willoughby Francis Wade—Does the Latinity extracted from every medical student answer best to the description of "merest rudiments" or of "solid attainments"? As regards medical students, are the terrible errors of the past, of the past only? These, gentlemen, are the opinions of men who have studied education as bearing upon the future life of the young, and are worthy of due consideration. I will now compare the knowledge of Latin with that of French and German, and will discuss it under three heads—first, mental discipline; second, culture; and third, utility in after-life. 1. *Mental Discipline. French.*—A good knowledge of French implies grammar, vocabulary, and idioms. An idiomatic language requires attentive observation. *German* is fully equal to Latin in those respects in which Latin is advantageous, viz. inflexion and conjugation, and the involved parenthetical construction of sentences. 2. *Culture.*—Latin is never so far studied, except by clergymen and some lawyers or some professed classical scholars as to be read with pleasure for the sake of reading alone. French and German are, when preliminary difficulties are overcome, brought up past the reading to the con-

versational point. 3. *Utility in After-life.*—The literature of the profession is largely French and German, and those who are responsible for the direction of the studies of men entering the profession who have little time for ornamental studies should have this in view, and get the greatest result obtainable in the time by seeing that the young men are in possession of the key which will enable them to open the depositories of much of the best modern information. Knowledge of Latin is always in the background in real life. French and German may any day be useful, and knowledge of either of them puts the veterinary surgeon on a level with his educated neighbours, and enables him to obtain data bearing upon much that may be difficult of explanation in the practice of his profession. To put an example of the utility of modern languages, let us suppose an outbreak of new and mysterious disease not discussed in the English language, would the inquirer turn to the Latin or the French and German for his information? Let the Royal College of Veterinary Surgeons ponder and carefully reflect before the imposition of what other and older corporate bodies are finding to be terrible errors of the past.

Professor Williams then made a few remarks on the new Pleuro-Pneumonia Act, and expressed the opinion that veterinary surgeons would certainly be placed in a somewhat awkward position. He also touched upon the method by which setons are supposed to be beneficial in the prevention of blackleg. In reference to the antiseptic treatment of enteritis, he stated that he had given a large dose of carbolic acid at first, and subsequently repeated doses of the hyposulphite of soda, with very marked results.

An interesting discussion took place.

Mr. Gofton, in reference to the Pleuro-Pneumonia Act, said he could not approve of it, as it would, in his judgment, place veterinary surgeons in a false position. Concerning the antiseptic treatment of enteritis, he would certainly give it a trial.

Mr. W. Hunter could not agree with Professor Williams as regards the subject of Latin. It was of the utmost importance that we should be able to write our prescriptions in that language, so he would make it a compulsory subject; he would also like to see French, German, and shorthand made optional. As to the Pleuro-Pneumonia Act, he considered we had been treated very badly in the matter, and it appeared to him that the travelling inspectors had the sole duty of stamping out the disease. In his opinion it should have been left to veterinary surgeons to carry out the provisions of the Act. As to enteritis, he had adopted the Professor's method of treatment with good results.

Mr. Bowhill next made a few remarks on setoning as a preventive for blackleg, and showed to the meeting a special instrument he was in the habit of using in the treatment of wounds.

The usual votes of thanks closed the meeting.

W. Ashton Hancock, *Hon. Sec.*

EASTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

The above Association held their half-yearly meeting at the Bell Hotel, Norwich, on Friday, August 29th, the President, E. J. Kitchin, Esq., Norwich, in the chair. After the usual preliminary business the dates of future meetings of the Society were discussed; it was finally arranged that the second Tuesday in February and July be the ones selected.

The *Secretary* next read a circular from the Central Veterinary Society respecting a "Resolution on Rabies." Each of the five clauses were discussed *seriatim* and unanimously adopted. The discussion on "A New Charter—is it needed?" was referred to the next meeting.

The *President* then called upon Mr. Dickinson, F.R.C.V.S, Boston, to read his paper on "Cold Water as a Therapeutic Measure."

Mr. President and Gentlemen,—The subject of my short paper is one which has given rise to great and exhaustive discussions in every branch of surgery and medicine. The practical study of the use of cold as a therapeutic measure can be arranged as follows: its local use in surgery, its general application as a tonic, and its employment in fevers. When cold is applied continuously to any particular region it acts as a direct and powerful depressant, varying, of course, according to its intensity. It is therefore used locally to reduce inflammation, chiefly when the latter is of an active type. It is well to be cautious in its application for this purpose and not to be too persistent, lest it suspend nutritive functions and interfere with the reparative process, which naturally form a part of inflammation. As is well known, excessive cold produces stasis and even gangrene, which might be the result of too energetic an employment of this agent. Locally, cold is usually applied by irrigation, sometimes by the application of pounded ice enclosed in india-rubber bags. A very useful mode of employing cold to the mammary gland of cattle is by using the ice-poultice made by mixing finely broken ice with fine dry sawdust.

In combating inflammation cold application must be continued until the desired effect is produced. Cold applied at intervals becomes a stimulant rather than a depressant, the subsequent reaction which follows the first impression being greater than its direct effect. This may be exemplified by the advantages of the cold douche as a stimulus to sluggish livers.

In pneumonia and pleurisy I have seen great benefit derived from the application of cold compresses, and have seen respiration and rapidity of pulse reduced in a short period. It is much used in croupous catarrhal pneumonia in children, especially on the Continent. Abercrombie and Niemeyer recommended the use of cold in peritonitis, but in this country there is greater favour shown to the use of warm poultices. In peritonitis in the horse I am convinced warm fomentations sometimes produce more pain,

and prevent the action of medicines (anodynes) than a steady flow of cold water over the abdomen. One patient, suffering from peritonitis from a punctured wound in the groin, showed great increase of pain whilst being fomented, but after leaving him alone I was surprised to find that the pain and restlessness abated. When for experiment, however, fomentation was continued, the pain and restlessness became manifest. This led to one of my first applications of cold, which was carried out from a tap in my infirmary, and the horse was evidently relieved, and expressed his gratitude as well as he could. I not only used cold to the abdomen, but directed the small hose in the wound, and from this my patient derived very great benefit. In a few hours his respiration and pulse were reduced, and his temperature lowered from 106° to 102·2°. In meningitis and compression I have seen the most remarkable relief given by the application of cold, both in ice-bags and by irrigation. It is well, if possible, to consider the feelings of the patient in the selection of cold or warmth. Each application at first appears to do good, but warmth cannot be so long employed as cold, because it frequently exhausts the patient, whereas cold has an exhilarating effect. Liebermeister's researches prove that a cold bath under judicious use increases the oxidation of tissue, whereby elevation of temperature of the body ensues, and from this may be seen the inadvisability of carrying either to the extreme.

Everybody who is a bather knows what a beautiful reaction follows a cold plunge, and that reaction proves its tonic effect, but if the bath be too severe or too long it becomes a direct depressant, debilitating and lowering the temperature of the bather. When the vital power is sufficient to react after the plunge, cold is not only a tonic, but a stimulant, but when it is not followed by reaction it may produce serious ill effects, partly from fatigue, and partly from excessive abstraction of heat from the body. For example, take the man Dalton after his swim from France to England. The use of cold in fever was very much practised during the last century, so it cannot be looked upon as any new feature, either in medicine or surgery. The Romans constructed small aqueducts from the large rivers for the purpose of irrigating their limbs after injury, especially for flesh wounds.

Before speaking with certainty of the precedence of cold over warm, it is imperative for us to consider the physiological effect of cold in inflammation and fevers. During irrigation to the body or to a limb the temperature certainly falls, although primarily there is increased animal heat. After irrigation the animal heat continues to fall, and gradually regains its former point. This evidence does not show there is any tissue waste or diminished urea, or carbonic acid formation.

From statistics gathered from medical authorities in nearly 20,000 cases, including typhoid and typhus, with all forms of complications, in all ages, in all kinds of practices, including military and civil life, the average mortality was slightly over 7 per cent. In these the treatment was carried out with more or less

care, whilst others who have conducted the treatment thoroughly, having confidence in it, the mortality was only a little above 3 per cent. From these statistics it is at once seen, and undoubtedly proved, that the cold-water treatment is attended with a very small percentage of deaths.

Many arguments may be used both for and against the cold-water treatment, especially in pneumonia, bronchial, and laryngeal affections. When the fever in pneumonia is of an adynamic type it can only be put down as the result of greatly increased temperature. In very severe lung diseases I have seen subsidence of fever from cold application, and in others of equal intensity the temperature remains exactly as it was when warmth has been applied. I have never noticed any ill effects from the use of cold, and can certainly say, on the other hand, that I have frequently wished I had used it in many cases where there has not been the accommodation. In all laryngeal affections cold irrigation to the throat will be found to be a long way ahead of warmth, or even stimulation. In scarlatina and purpura cold effusion has a very marked effect, particularly if the throat be very painful and deglutition impaired.

In conducting this treatment certain care should be taken, which ought to be remembered, especially in the treatment of fever. You cannot give the patient cold unless the temperature of the body be reduced to nearly normal. The temperature will sometimes continue to fall after the cold bath, which is a guide not to prolong the bath. It is, therefore, most advantageous to employ it when the thermometer registers 104°. A cold bath, or any other application, never does good unless it removes the heat, but the cold should not be applied more severely than necessary. Perhaps it would be as well to describe how these baths are conducted, and this I will do when treating of their use in surgery.

From a surgical point of view cold plays a more important part in the treatment of injuries, solutions of continuity in soft structures, sprains, and fractures, than can be said of it in medicine—at least so far as the veterinarian is concerned. I take it that cold is the most powerful agent in relieving and preventing inflammation we have yet discovered. It relieves pain by causing contraction of the different vessels, and limits, to a great extent, exudation, thus preventing tension and swelling. Never should the cold be so intense as to seriously lower the temperature of the injured part, or the mischief may be caused which the surgeon intended to prevent. In sprained tendons, capped hocks, badly broken knees, recent curbs, laminitis, injuries to the hock or other joints, the application of cold must be continuous until the danger of inflammation is passed. If applied at intervals the hysteræmia periods, which occur between the cold applications, undo whatever benefit has been derived during the time the part has been cooled. Irrigation may be continued in such cases as above mentioned for from six to eight hours where a continual stream of water can be obtained. This is not a difficult matter, either from a pump or a tap. If from a pump I generally fix up a barrel and pump it full of water. I have a

small india-rubber or leaden pipe inserted into the bottom of the barrel, and conduct the pipe to the injured limb, and coil it round, first perforating it to the extent of eight or ten inches up the coiled end round the limb. This is very useful where it is not convenient to remove the patient. When acute inflammation has subsided, and the vessels of the part remain relaxed, cold is often a powerful agent in restoring lost tone to the parts, and for this purpose common salt and water is most beneficial.

When inflammation is well established, with swelling, heat, and pain, cold does harm, as it acts as a depressant and diminishes the flow of blood by causing contraction of the arteries, increasing adhesion of the corpuscles, and retardation of the blood-flow. Cold should never be applied when suppuration threatens.

In poll-evil, where the sinus can be opened so as to admit of a stream of cold water, I find it adds greatly to the success to irrigate in this manner two or three hours daily for a week. Afterwards the use of a mild astringent injection will often bring about a healthy action of the part, cutting short these troublesome cases, and saving a lot of time and annoyance.

Lymphangitis is one affection which is probably relieved much more quickly by irrigation for from five to six hours a day than any other malady; the pain, fever, and swelling are less by cold treatment than warm. Injuries to the legs from barbed wire do remarkably well under antiseptic irrigation, either with Jeyes' fluid or bichloride of mercury. The cases, in some instances, cause much trouble owing to their septic tendency, which is accounted for by the possibility of inoculation from the wire. The method I adopt is by placing a piece of bichloride of mercury in the india-rubber tube, and allowing a steady flow of water over it with Jeyes' preparation. I adopt the plan described by the proprietors in the sanitation of water-closets, by impregnating the water with their fluid through the medium of their fluid distributor.

The numerous discussions and opinions regarding the efficacy of warm and cold applications in the treatment of laminitis have not yet led veterinarians to adopt the one or the other as a general rule. Personally I use cold in every case, and can safely say I have never seen it fail in securing what I desired. Some years ago I was attending a six-year-old cart-horse suffering from laminitis. He was in a small stall, from which I had him removed to a good open shed in a field. When on his way to this more commodious apartment he went to the pond for the purpose, I thought, of drinking, but, to the surprise of all concerned, it was to cool his poor, painful feet. He walked into the pond up to his knees and hocks, and there remained for some eight or nine hours, when he was, with great difficulty and the whip, persuaded to occupy a place under cover. The pond served for this horse's foot-bath for several days. On the second day, for experiment, we placed the forefeet in warm bran poultices, and opened the door of the box, when the patient again walked with great difficulty to the pond. This horse made a very good recovery from his own selected treatment, and the assist-

ance of bar shoes, &c. Since this exhibition of a patient's knowledge I have treated laminitis with cold water instead of warm, and prefer it. Attached to my infirmary is a bath 2 ft. deep, and 14 ft. by 8 ft., which can be supplied with hot or cold water in thirty-five minutes. To the end of each pipe is a jointed circular pipe, perforated for irrigation of any part or the whole of a horse's body, so that it has and I hope will afford the very best advantage for testing the use of cold and warm applications.

Mr. Dickinson next exhibited a number of appliances which he used in conveying the water to different parts of the body, and minutely described his method of fixing them.

The discussion that followed assumed more the form of an interrogation, each member acknowledging his experience to be very limited as regards cold-water applications; but everyone found the essayist most willing to answer any questions and give clinical proof of all the advantages which he claimed for the superiority of the cold over hot water as a therapeutic measure in a large majority of cases. The appreciation of Mr. Dickinson's remarks was most clearly indicated by the cordial vote of thanks proposed by *Mr. Shipley*, and strongly supported by all present.

R. S. Barcham, *Hon. Sec.*

SCOTTISH METROPOLITAN VETERINARY MEDICAL SOCIETY.

Veterinary Surgeons and the Pleuro-pneumonia Act

At a special meeting of the Scottish Metropolitan Veterinary Medical Society, held in Edinburgh, "for the purpose of considering the new Pleuro-Pneumonia Act, and the position of veterinary inspectors and the profession generally as affected by its provisions," Mr. H. Thompson, Aspatria, president of the Society, occupied the chair.

The *Chairman* explained the object of the meeting, and stated that the greatest indignation was being felt with regard to the treatment of the veterinary profession under the new Act. The *North British Agriculturist* and the *Evening Despatch* were the only two papers that had taken the matter up seriously, and these two papers deserved the hearty thanks of the profession for the noble stand they had made on behalf of the profession. He hoped the question would be discussed by the meeting dispassionately, but at the same time they should let the Lords in the south know that there were Chiefs in the north.

Mr. R. Rutherford, hon. secretary, read the circular calling the meeting, in which he indicated the points set down for discussion —the Act itself, the manner in which it affected veterinary inspectors, past, present, and to come, and how it affected the profession outside of them. He read a letter from Mr. A. J. M'Intosh, Dum-

fries, who wrote expressing his regret at being unable to be present. Mr. M'Intosh said he had read the articles on the subject in the *North British Agriculturist*, and he endorsed every word as to what had been said as to the insult that had been offered to the profession. More disgraceful treatment of the profession he had never known. Their profession had Professor Brown to thank for it. Poor, helpless profession! He had no doubt plenty of inspectors would be found to take out the lungs, put them in a box, and carry them to the railway station. If there was any pluck in the inspectors, not one should work under the conditions. Every veterinary society ought to resolve to stand against the work, and then something would come of it. He would never be one of those to help in carrying out such work, and he trusted that Edinburgh would give a very decided opinion. Fancy Williams, Walley, and M'Call sending lungs to London for an opinion as to whether or not they were affected with pleuro! He was a Conservative in politics, but he had never seen anything better calculated to bring about a strong desire for Home Rule. (Applause.) Mr. Alexander Pottie, V.S., Paisley, wrote that, instead of stamping out the disease, the new Act would cause considerably more delay. A veterinary inspector was not to be allowed to make a *post-mortem* without consent, but there were many cases which would require the wisdom of Solomon to decide without a *post-mortem*. It seemed to him a most ridiculous proceeding to first declare stock infected, and then ascertain by *post-mortem* whether they were correct. Mr. A. Hutcheson, Dundee, also wrote in condemnation of the provisions of the Act for inspections. He held very strongly that men called upon to perform such duties should be practically acquainted with the habits of cattle and with the district in which they were called upon to act. Mr. Cameron, Berwick-on-Tweed, wrote in a similar strain, and said that one cause of the failure of the stamping-out process was the want of veterinary inspectors. There was only one veterinary inspector for the County of Northumberland. He (Mr. Cameron) and others had for many years reported cases of pleuro, for which they got neither thanks nor reward. Mr. Donald, Wigton, wrote that he felt a gross insult had been done to the profession by the action of Mr. Chaplin and his Board. The best course for the profession to adopt, while present conditions remained, would be to maintain a position of passive inactivity. If the Board of Agriculture could dispense with the services of the veterinary profession in dealing with animal diseases, he thought the profession could manage to live without their aid. Unless the Board was assisted, and very largely assisted, by practising veterinary surgeons, pleuro would be more rife and widespread under the new administration than ever it had been under the old. If the Government desired to repeat their cattle-plague experience, in spite of warning, he should be disposed to allow them to go on. Was it intended to declare a man's cattle provisionally affected with pleuro on the opinion of a police officer, and then go through the red tape of officialism by arranging for the slaughter of one animal as a test

case? If that was the proposed method, he thought the stock-keepers had better be on the alert. Mr. Fisher, Whitehaven, wrote that he would have nothing at all to do in the matter under the proposed arrangements. He considered the conditions proposed for the local veterinary inspectors were insulting and degrading. The county veterinary inspectors were a more spiritless lot than he took them to be if they submitted to officiate under the proposed conditions. It was preposterous to ask them in the first instance to take all the responsibility, and then be shunted out of the way to make room for the supposed greater lights from London, some of whom might possibly never have heard of pleuro till they started from London with their instructions in their pockets. Apologies for absence, and expressing sympathy with the object of the meeting, were intimated from Professor Walley, Edinburgh; Professor M'Call, Glasgow; Mr. Greaves, Manchester; Mr. Bell, Carlisle; and numerous other members of the veterinary profession.

The *Secretary* read the draft of the "General Procedure under the Act," issued by the Board of Agriculture.

The *Chairman* said that one point they had taken umbrage at was the proposed appointment of retired naval and artillery officers as inspectors to take the place of veterinary surgeons. With reference to the "travelling inspectors," he had had experience of one of them. They had a heavy dose of pleuro within three miles of his place. A travelling inspector was called down to proscribe the area; but the disease spread so fast that he had to proscribe the whole county, and they had not got rid of it all yet. That travelling inspector showed a lamentable amount of ignorance of the disease. Amidst great laughter, Mr. Thompson detailed how, on one occasion, an outbreak occurred in two byres, situated comparatively near each other. The travelling inspector wanted to find out how the disease had spread from the one byre to the other. After rummaging about the premises, he discovered a gangway leading from the one byre to a hay loft overhead, which opened out on the open space near the other byre. "Ah," said the inspector, "I've got it now. The disease has gone up the gangway and through the hay loft, and dropped down on the other byre there." (Laughter.) That meeting, continued Mr. Thompson, was only a feeler. He expected that there would be a mass meeting of the profession to take the matter up, unless they could arrive at some resolutions that would assist the Board of Agriculture in amending the Procedure Act before it came into force on the 1st September. They wished to have properly defined the duties of No. 1 inspector and of No. 2 inspector. In one section of the Act the "local inspector" was the veterinary surgeon, and in another he was the police officer who had power to call in the veterinary surgeon. He pointed out that after the end of August veterinary inspectors must not, under any circumstances, order the slaughter of cattle until they were directed by the Board of Agriculture, otherwise they might find themselves in a difficulty, from which it might not be possible to extricate themselves. In some cases it was difficult to

say whether an animal was suffering from pleuro. All they could say was that some of the symptoms were there. The new Act provided that upon an outbreak the owner must inform a policeman. But who was to tell the owner that disease existed, if at present at certain stages the veterinary surgeon had a doubt? The procedure contemplated was absurd. If the "local inspector" thought disease had broken out, then the lungs of a slaughtered animal were to be sent to London for some of the great lights there to say whether it was pleuro or not. He thought the veterinary surgeon on the spot was as able to examine the lungs and detect disease as any individual who never dirtied his patent-leather slippers in a byre. (Laughter.) He should like to know if Professor Brown had anything to do with the drawing up of the Act. He did not think that Professor Brown had done much for the profession. He sent out students, and then took the bread out of their mouths by a publication of which they had all heard. (Hear, hear). The biggest insult he ever offered to the profession was when he sent out that Act.

Principal Williams argued that with the travelling inspectors they had nothing to do. What they had to do was to discuss the clause in which it was stated that upon receipt of the intelligence the Board of Agriculture would immediately direct the slaughter of one of the diseased cattle, under the supervision of a veterinary surgeon. Up to that point of the proceedings there was no professional authority at all that the disease was pleuro. The veterinary surgeon had no power to say it was not a case of pleuro. He was called in simply to arrange for the valuation of the animal, and to send the lungs securely packed to London. He was not to express an opinion as to whether it was a case of pleuro or not; he was simply there to see the animal killed, and to pack the lungs and send them on to London. They were all desirous to assist the Board of Agriculture in suppressing pleuro, but he thought the Board should have endeavoured to have taken the veterinary profession along with it. It was an insult to the profession. He would pack no lungs in a box; a labouring man was quite competent to put the lungs into a tin box. After this point the responsibility of the veterinary surgeon began, as he had to examine and report on the other animals. If the examination in London proved the animal to have been affected, the Board would instruct the veterinary surgeon to have valued and slaughtered all the cattle which in his opinion are diseased. When he had done that the Board would send a travelling inspector, and the veterinary surgeon would be shunted. The result would be that in isolated districts owners would not report at all.

Mr. Storie, East Linton, protested against the new procedure, and urged that a memorial should be forwarded to the Board signed by as many members of the profession as possible. He hoped if they could not make any alteration in the Act every inspector would resign, and that they would not demean themselves by acting as was proposed they should do. The travelling inspector was to

be a soldier, a sailor, and a botanist, who knew nothing whatever about cattle. (Laughter.)

Mr. Rutherford, Edinburgh, held that the reporting of the contagious disease being left to the owner was a weak point in the Act. This was an Act which hit exceedingly hard at men who had long and honorably filled the post of inspectors, but there was another view of it, and that was that the whole veterinary profession would more properly fill the position of inspectors, so as to assist in the eradication of the disease. He had held, and still held, that the veterinary surgeon should have the responsibility of reporting the disease as much as the owner. In advocating such a procedure he was operating against his own interests, but he was prepared to offer his best advice as to the manner in which it should be done. It should be insisted upon that the veterinary surgeon also report the presence of the disease.

Mr. Thomson, Aberdeen, said he did not interpret the instructions in exactly the same light as Professor Williams. He presumed that no policeman would say on his own responsibility, that any stock-owner had got pleuro-pneumonia, but that he would have power to call in a veterinary surgeon before declaring the disease. What he objected to and deprecated very much was that the power should be taken from veterinary surgeons of verifying their diagnosis, whether right or wrong, prior to making their report. That was where the hardship came in, for the veterinary surgeon was often called in to define a conglomeration of symptoms which could not be defined with certainty without a *post-mortem* examination. The veterinary surgeon, therefore, was called upon to stake his reputation by pronouncing a definite opinion on such symptoms, while he was absolutely debarred from verifying his opinion by a *post-mortem*. A suggestion had been made by the Aberdeenshire Local Authority that the Board of Agriculture should institute inquiries as to the channels of trade in special districts, for he thought it would be quite possible to so arrange matters that a county inspector, with his subordinates, should still perform the duties as at present. He would not be influenced by any selfish views, if he saw that the new orders were likely to be carried out with greater efficiency than hitherto ; but he looked forward to bungling, inaccuracy, and inefficiency in investigating all the circumstances which led up to an outbreak. He regarded the travelling inspectors as quite incompetent to put the questions necessary to trace the disease. He thought the profession was being put on one side, and supplemented by men whose experience among cattle disease or hygiene was comparatively *nil*. He thought they should not come too hastily to a conclusion, but have a representative meeting of all veterinary surgeons with the view of putting pressure upon the Government and to show them that there was no desire to boycott the Act, but that they were animated by a patriotic desire to give all the assistance in their power in stamping out pleuro-pneumonia.

Mr. Anderson, Glasgow, said the new Act was merely an auxiliary to the Contagious Diseases (Animals) Act. The penal clauses of

that and other Acts still existed, and the new Act simply transferred the working of the Act, after the detection of disease, from the Local Authority to the Privy Council. He did not think they should be so thin-skinned about sending the lungs to London. If they had had as much experience of pleuro-pneumonia as he had, they would see that it was necessary that the lungs should be inspected by a competent authority, and the Board in London comprised three very competent men. He thought they should put their pride in their pocket, and see how the Act would work before they began to complain. So far as the intimation of outbreaks was concerned, he thought the onus of reporting disease to the Local Authority inspectors should still rest on the police.

The *Chairman* suggested that, instead of sending the lungs to London, the Board of Agriculture should appoint three competent veterinary surgeons—say, the county veterinary inspector, the local veterinary inspector, and another veterinary surgeon—to examine the lungs, and their decision should be final. That method would save a great deal of time and money.

Mr. Cunningham, Slateford, proposed the following resolution:—"That, in the opinion of this meeting, the position of a veterinary inspector under the new Pleuro-Pneumonia Act is beneath the status and dignity of a veterinary surgeon, and some of the duties he is called upon to perform are foreign to the nature of his calling."

Principal Williams at this stage read a letter which he had received from Mr. Cope, of the Board of Agriculture, in which he wrote:—"For all practical purposes the veterinary inspectors throughout the country will remain in exactly the same position as regards duties as before. Indeed, we contemplate requiring further professional work of them than they have generally been called upon to give to Local Authorities, and for the services they render I do not think they will have any cause to complain, so far as the rate of remuneration, &c., goes. In every outbreak reported, a M.R.C.V.S. will be called in at once, who will have to report, as now, his views as to the existence of disease, but—what will, I hope, be considered more satisfactory—to us and not to the Local Authority. Besides examining the cattle for pleuro-pneumonia, we shall require professional opinions as to the state of all the cattle slaughtered and of all the carcases prior to their being sold for human food. This will all be very responsible work, and will be carried on in conjunction with the professional officers of the Department, and we hope you will advise the members of the profession to assist cordially in carrying out the duties. It is quite an error to suppose that any but professional men will be engaged to carry out the duties which I have above mentioned." In a subsequent letter, Mr. Cope wrote that "the lungs of every first animal slaughtered will be sent to the Royal Veterinary College, because we have no convenience here for examining them. They will not be subjected to the views of any of the College staff, but will be examined by Professor Duguid and myself." Principal Williams added that these letters

showed that the action of the profession in Scotland in calling that meeting had not been without effect.

Mr. Cunningham, Slateford, said the post of veterinary inspector under that Act was not one which veterinary surgeons with any self-respect could hold. At present if a veterinary inspector thought that pleuro existed, he ordered an animal to be killed to see whether he was right or wrong; but under the proposed rules he was compelled to send the lungs to London for the authorities there to say whether it was pleuro or not. What veterinary surgeon was going to do that? Such a duty was beneath the dignity of a veterinary surgeon, and they should say so at once. He did not think any of them could act as inspectors after the 1st September unless the Procedure Act was amended. As to the travelling inspectors, they were utterly useless for anything but spending a lot of the public money. One of them called upon him one day about a reported outbreak, and he drove him to the place and back again, a distance of some twenty miles. When they got back the inspector offered him 4*s*. 6*d*. for driving him that distance, and on his refusing to take it that official said: "You should take it; it's Government money." (Laughter.) He could tell how much that inspector (whom he named) knew about cattle, provided the reporters would leave it out. Mr. Cunningham was proceeding to expose the crass ignorance of cattle displayed by this inspector when

Professor Williams interrupted, and said that this gentleman was evidently no worse than the rest of these inspectors.

Mr. Anderson, Glasgow, said they ought to meet the Act with acclamation, and try by every means in their power to do what was requested of them and to make the Act a success. (Cries of "Oh, oh.")

Mr. Connachie, Selkirk, said the sole thing they had to complain of was the proposal to send the lungs to London. In the alphabetical summary of the Contagious Diseases Act it was said that when an animal was suspected of suffering from pleuro-pneumonia a *post-mortem* examination must be made by the veterinary surgeon, as the *post-mortem* appearances of disease were so readily detected. Had the *post-mortem* appearances become more difficult to discover and recognise in 1890 than they were in 1878? He was a veterinary inspector of twenty-five years' standing, and he had gained the confidence of the different Local Authorities for whom he had acted as inspector; and he thought it was degrading that he should be asked to send the lungs to London to see if disease existed after he had taken the onus and responsibility of declaring an animal infected. The veterinary authorities in London had floundered about the country with their Slaughter Order for nearly two years and the disease was rifer now than it was when the order was, issued. They had proved themselves a *coterie* of hopelessly helpless incapables. (Laughter.)

Mr. Anderson said the meeting misunderstood the Act entirely. In his view the lungs were to be sent to London for the purpose of confirming the local inspector's diagnosis. Professor Brown was

the head of the Veterinary Department, and they must have a head in working such an Act.

Principal Williams: Yes; but he wants to be head and tail and everything else. (Laughter).

On a show of hands Mr. Cunningham's motion was carried, Mr. Anderson being the only gentleman who voted against it.

Mr. Thomson, Aberdeen, moved—"That the meeting memorialise the Board of Agriculture to afford to veterinary surgeons or inspectors reasonable facilities by *post-mortem* examination for proving the accuracy of their diagnosis before making a declaration."

Mr. Reid, Auchtermuchty, seconded, and *Mr. Anderson,* Glasgow, supported Mr. Thomson's motion, which was carried unanimously.

Principal Williams proposed—"That instead of being compelled to send the lungs to London for examination, the veterinary inspector of the district shall consult with the veterinary inspector for the county, with a veterinary surgeon acting for the owner of the cattle; and only in cases of dispute shall the lungs be sent to London, as proposed by the new procedure."

Mr. Connachie seconded the motion, which was adopted.

The *Chairman* complained that the travelling inspectors were not chosen from the profession, and suggested that some resolution condemning this should be drawn up.

Professor Williams maintained that this was not a professional question at all. He looked upon these travelling inspectors as a sort of superior police. He did not think, however, that the Society should interfere in the matter; but at the same time it was, as the country would find, a very expensive system.

This subject then dropped, and, on the motion of *Mr. Cunningham,* seconded by *Principal Williams,* it was agreed to send copies of the resolutions passed at the meeting to Mr. Chaplin, the Minister of Agriculture. A vote of thanks to the chairman brought the proceedings to a close.

R. Rutherford, F.R.C.V.S.,
Hon. Sec.

[We regret having to occupy so much space with such controversial matter as is contained in the preceding report. A condensed notice would have been sufficient to place on permanent record. In calmer moments those members of the Society who took the most prominent part in the discussion will, we trust, see that the course taken by the Authorities was absolutely necessary to free the country of such a pest as pleuro-pneumonia. Half measures would have been useless, for it is a well-established fact that besides concealment of the existence of the disease by cattle-owners, dealers, and others, many members of the profession have, from the insidious nature of the malady, failed to detect its existence in the living animal or even to recognise the peculiar morbid changes which are wrought in the lungs on making an autopsy.

It was therefore absolutely necessary for success that the Board of Agriculture should appoint a central and responsible Authority to determine the existence or not of the disease in slaughtered animals.

Indeed, its extermination would never be effected otherwise, and even with it the task will prove to be one of the greatest difficulty. That the disease will, however, ultimately yield to the stamping-out process unflinchingly adopted, nothwithstanding its existence in the country for fifty years, we do not doubt. Once free from it, the adoption of the same precautions which have proved effectual in preventing the reintroduction of cattle plague, foot-and-mouth disease, and other contagious maladies, will be equally so with pleuro-pneumonia.]

MISCELLANEA.

BOMBAY INTELLIGENCE.

We learn with much satisfaction that Mr. J. H. Steel, Principal of the Bombay Veterinary College, has been appointed a Justice of the Peace for the City and Island of Bombay. Mr. Steel, as our readers will remember, was for some time prior to his departure for India, one of the teaching staff of the Royal Veterinary College—a position which he filled throughout with credit to himself and advantage to the Institution.

LAHORE VETERINARY COLLEGE.

The report of the Lahore Veterinary College for the past official year is a record of good work, both on the part of the teaching staff and of the students. Additional interest is lent to it by the fact that it was the last report that would be submitted by the late Principal (Mr. Kettlewell), whose services will soon be lost to the school which he has so successfully started. Both the Director of Agriculture and the Local Government express their approval of the good work done by Mr. Kettlewell, and it is to be hoped that the success which has been achieved will be continued under the future management. Turning to details, we see that ninety against seventy-two students of last year attended the summer session, and that the "results of the final examination were most gratifying." Out of forty-five students presenting themselves twenty passed in the first class and seventeen in the second, and one passed in hospital practice. This must be regarded as very substantial success. The Lord Lawrence Memorial Fund has contributed five scholarships of Rs. 120 per annum each to the school, and there was keen competition for them; "four out of five successful competitors for these scholarships have passed out most successfully." The hospital practice of the school comprised the treatment of 336 equine in-patients, 387 out-patients, 431 bovine patients, and eighty-four surgical operations. The fees and forge charges yielded a sum of Rs. 5001, against Rs. 3659 in the previous year.

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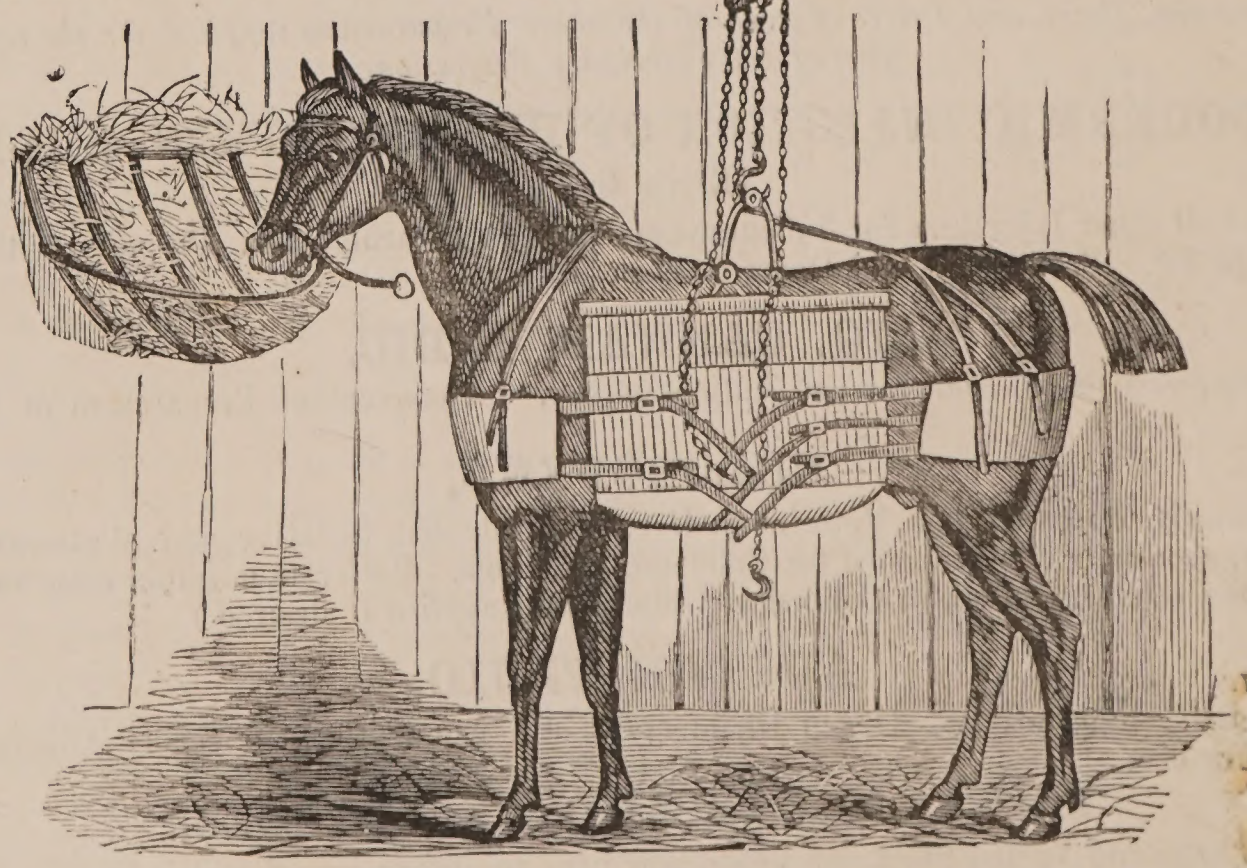

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A Subscription of *twenty guineas* entitles the Subscriber to all the privileges of the Institution, as a general Veterinary Establishment and Hospital for Animals, for life; and an annual payment of *two guineas*, to the same privileges during the continuance of such Subscription.

A Subscriber is entitled to have admitted into the Hospital for medical and surgical treatment, an unlimited number of Horses or other animals, his own property, at a charge only for their keep. Also, without the payment of fees, to have the opinion of the Professors as to the treatment of any animal he may wish to retain in his own establishment.

A Subscriber has likewise the privilege of having five horses examined *as to soundness* in the course of a year, and to receive the opinion of the Professors thereon, either verbally or in writing, free of charge; and also any further number at a fee of ten shillings and sixpence for each *extra* horse, or to have ten horses examined on payment, in addition to his Annual Subscription, of two guineas, or such other sum as shall from time to time be fixed by the Governing Body or General Purposes Committee.

The Professors do not examine horses for soundness out of the Institution, nor do they visit patients, except on very special occasions, and then only with the object of their being removed into the Hospital for treatment.

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ROYAL VETERINARY COLLEGE.

By the Royal Charter of Incorporation the GOVERNORS have power "to confer upon and grant to such of the Students of the said College, as they shall think fit, *Annual or other Exhibitions, Scholarships, Medals and other Prizes and Certificates of Distinction.*"

A SCHOLARSHIP of £25 per annum, tenable for two years, was awarded for the year ending June 30th, 1890; and an additional Scholarship of the same amount will be awarded in 1891. Beside the COLEMAN PRIZE MEDALS; CLASS MEDALS, PRIZES and CERTIFICATES are given in each division of the Students' studies.

In addition to these Prizes the Royal Agricultural Society awards a *Silver* and a *Bronze Medal* to the two Students who may pass the best examination in the Pathology of Cattle, Sheep, and Pigs, at the Diploma Examination of the Royal College of Veterinary Surgeons.

The College Entrance Fee is *Sixty Guineas;* The payment of which confers the right of attendance on *all* the Lectures and Collegiate Instructions. The fee may be paid in *three* instalments, viz., Twenty Guineas on *entry,* Twenty Guineas at the end of the *first period* of study, and Twenty Guineas at the *second period* of study—the first instalment must, with the Matriculation Examination Fee of One Guinea, as well as the Library and Reading Room Fee of One Guinea, be paid prior to this Examination.

A Pupil, previously to his admission, is required to produce a recognised Certificate of Educational Acquirements, which must include all the pass subjects of the Matriculation Examination, or otherwise he must pass an Examination in *Writing, Reading aloud, Dictation, English Grammar, English History or Geography, Arithmetic, and French, German, or Latin.* A Pupil may also elect to be examined in any of the following subjects, *not exceeding two :*—Euclid, Books one and two; Algebra to Quadratic Equations inclusive; Natural History (Botany, Geology, or Zoology); Physiology; Chemistry; Physics; and the Greek, German, or Italian Languages.

The Educational Year is divided into a Summer and Winter Session of three terms, and begins on Oct. 1st and ends the middle of May.

Lectures, Clinical and Pathological, Demonstrations, and General Instruction, are given on Diseases of the Horse and other Domesticated Animals, including Epizöotics, Parasites and Parasitic Affections; also on Bacteriology, Comparative Anatomy, Physiology, Histology, Chemistry (General and Practical), Materia Medica, Toxicology, Botany, Therapeutics, and Pharmacy; Hospital Practice, Obstetrics, Operative Surgery, The Principles and Practice of Shoeing, &c.

Besides these Lectures and Demonstrations, the facilities which exist in the Institution are such as to enable Pupils, by attention to their duties, to acquire a well-grounded practical knowledge of their profession, and thus, on obtaining their Diploma, to at once merit the confidence of the public. This will become fully apparent when it is remembered that, for several past years, upwards of 2000 animals have been annually prescribed for and treated as GRATUITOUS PATIENTS *by the Pupils under the Supervision of the Teachers.*

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A Student, during his Academical Course, has to undergo *three* examinations by the Royal College of Veterinary Surgeons. To be eligible for the FIRST he is required to attend, *at least,* one Winter and one Summer Session; a second Winter and Summer Session before being eligible for the SECOND examination; and a third Winter and Summer Session before being examined for the Diploma of the College.

The Examinations are held in May and December.

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G. T. BROWN, C.B., Professor, Principal of the College and Lecturer on Contagious and Parasitic Diseases.
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